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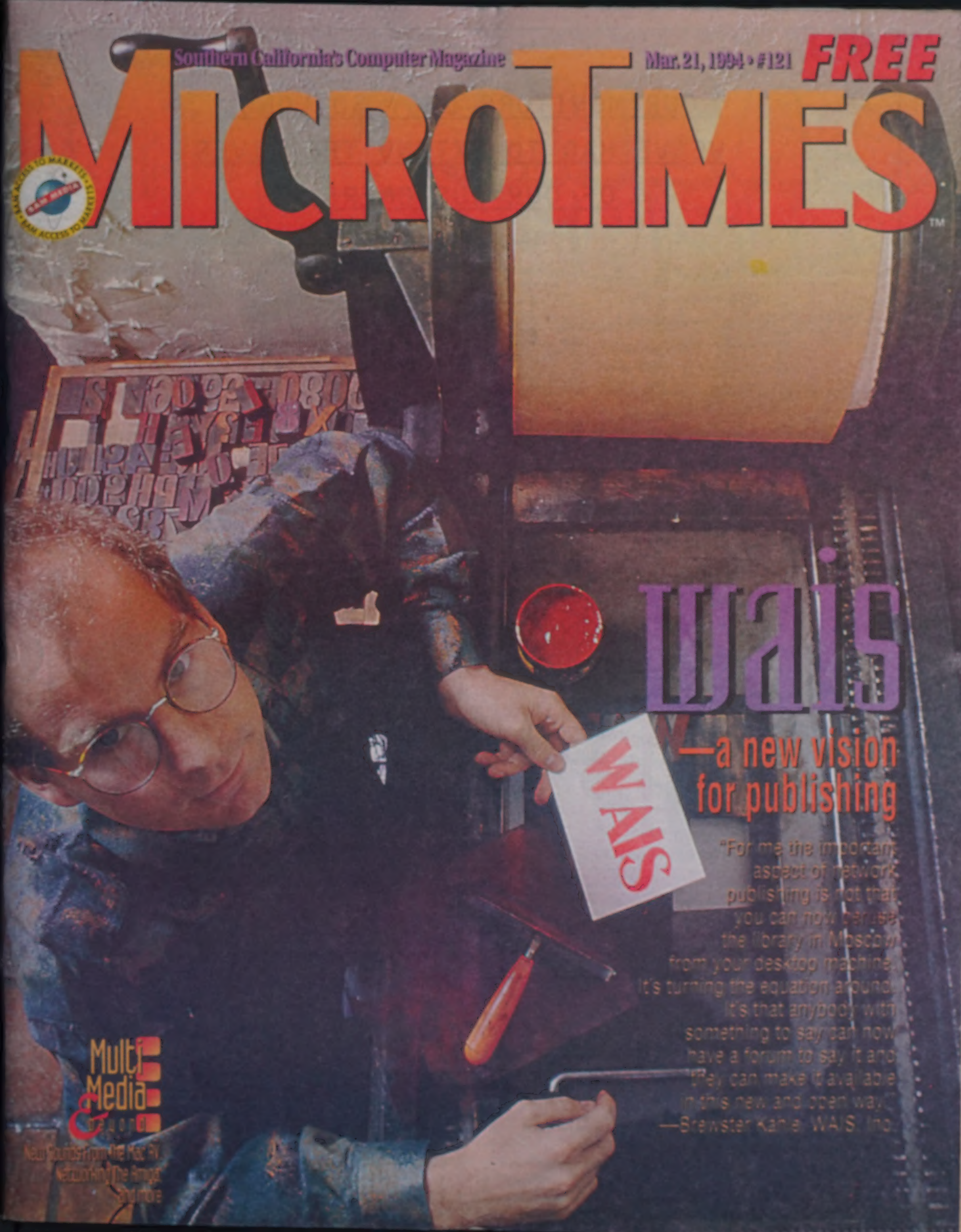


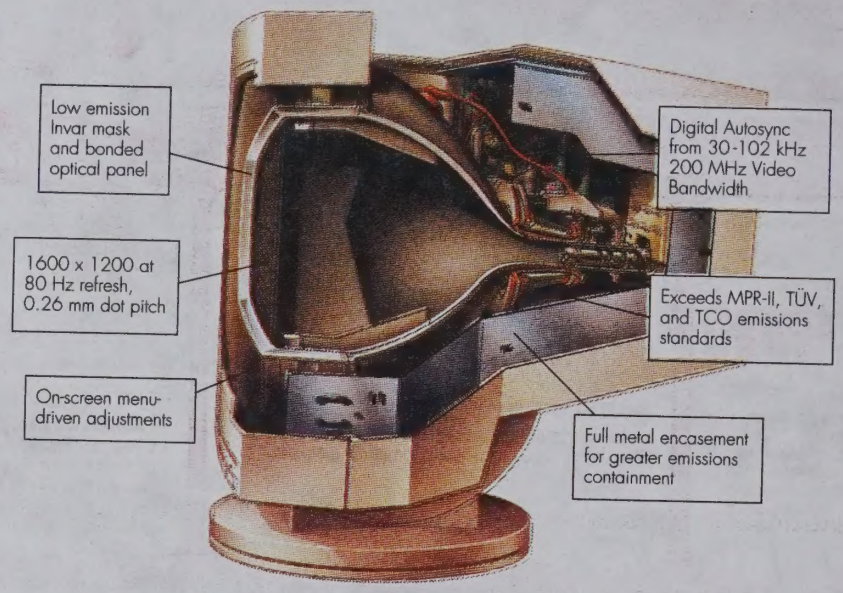
WAIS —a new vision for publishing

"For me the important aspect of network publishing is not that you can now peruse the library in Moscow from your desktop machine. It's turning the equation around. It's that anybody with something to say can now have a forum to say it and they can make it available in this new and open way."
—Brewster Kahle, WAIS Inc.

Multi Media & the Arts

New Sounds from the Mac AV
Groundhog Day Movie
Sky Movie

OUR MONITORS LAST SO LONG, WE'VE HAD TO EXTEND THE LIVES OF OUR CUSTOMERS.


Low emission Invar mask and bonded optical panel
1600 x 1200 at 80 Hz refresh, 0.26 mm dot pitch
On-screen menu-driven adjustments
Digital Autosync from 30-102 kHz 200 MHz Video Bandwidth
Exceeds MPR-II, TÜV, and TCO emissions standards
Full metal encasement for greater emissions containment

True, nobody's drawn a direct connection between video display emissions and longevity. But people are worried enough to have government-set limits on them. The strictest limits come from Scandanavia. So do the monitors that cut these emissions so low they can't even be measured: Nokia. Nokia monitors with MicroEmission® far surpass even TCO*—the toughest emissions standards in the world—with bonded display panels and full metal encasement.

Fine. But what does that leave you to look at?

NOKIA MICROEMISSION GREATLY REDUCES MAGNETIC AND ELECTRICAL FIELDS EXPOSURE BELOW THE CURRENT MPR-II AND TCO STANDARDS.

Well, Nokia MultiGraph® series monitors are arguably the most vivid in the world. In fact, the vast 21" unit achieves a 1600 x 1200 display at a remarkable 80 Hz refresh rate with 0.26 mm dot pitch. In other words: Huge, clear and absolutely flicker-free. The unique FullScreen® feature eliminates the dead border without edge distortion. The picture can be adjusted not just horizontally and vertically, but also trapezoidally and orthogonally. More impressively, the DigiControl™ on-screen menu-driven display adjustment can memorize your workstyle preferences (which is faster, easier, and far more precise than reaching for knobs hidden in the back somewhere.)

And Nokia monitors offer user-defined PowerSaver™ which further reduces those wicked emissions. It also saves the tube and helps the whole unit last longer. Before you buy your next monitor, look into a Nokia. It could be the decision of a lifetime.

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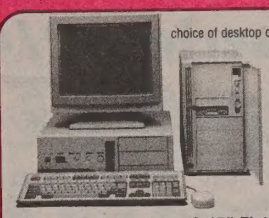

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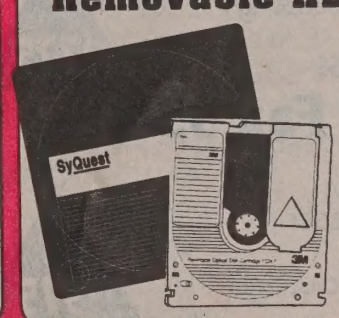

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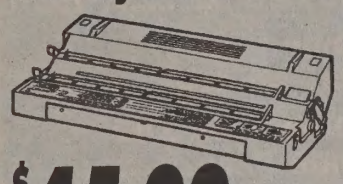

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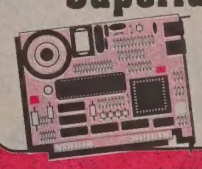

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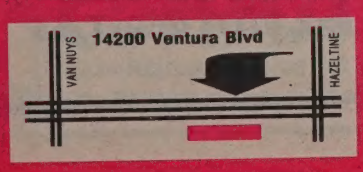

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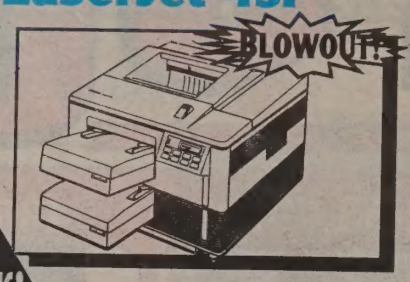

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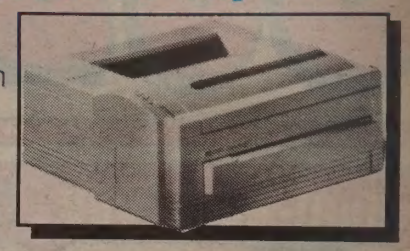

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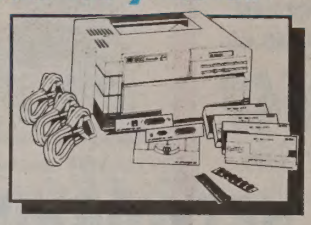

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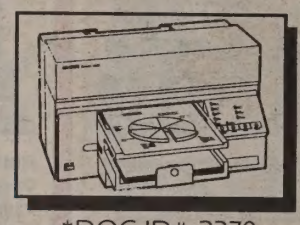

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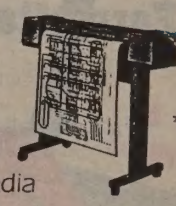

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Desktop publishing was only the beginning. Now it's possible for someone in California to read documents from all over the world as if they were on the desktop computer, and possible for any author with net access to "publish" globally. The implications—for business, education, government, and almost every other aspect of the culture—are enormous, and in this month's cover story, Michael Robin talks with Brewster Kahle about some of them. We hope you find it interesting and that it inspires you to go sample the world of online publishing.

—ME

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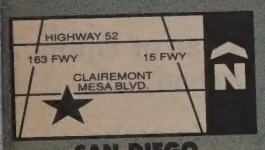

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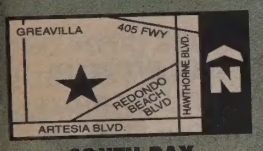

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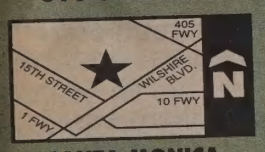

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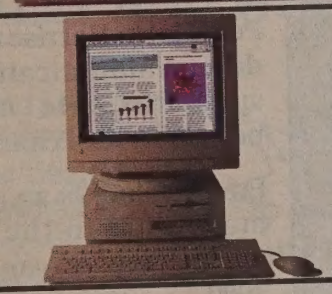

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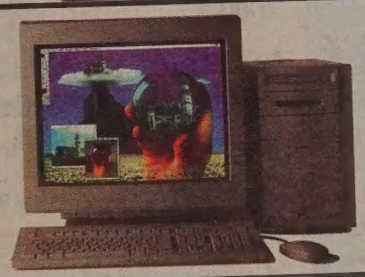

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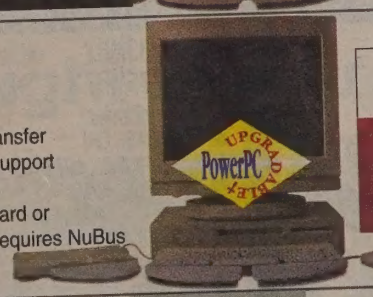

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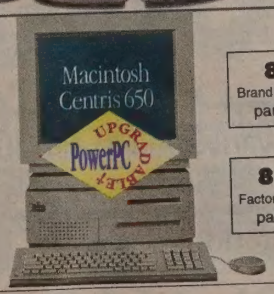

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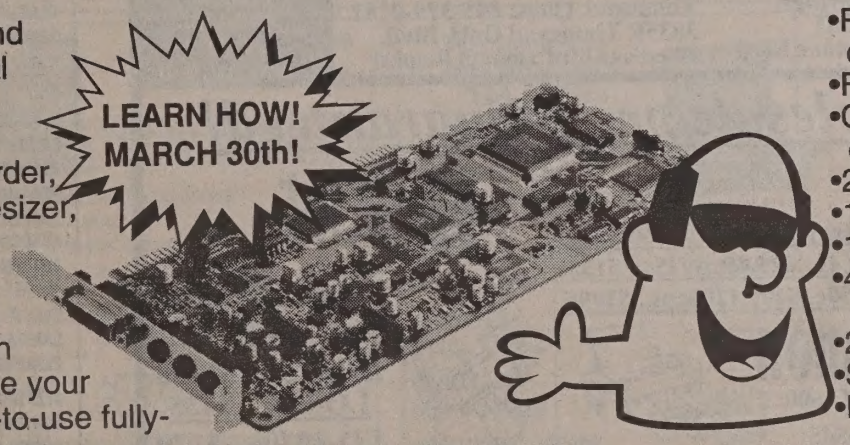

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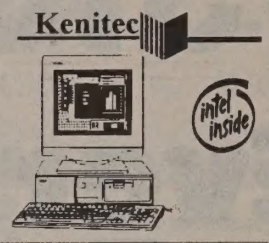

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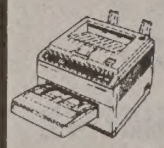

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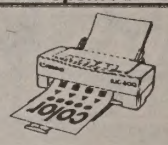

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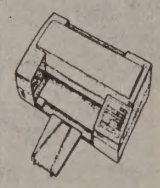

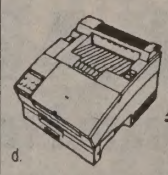

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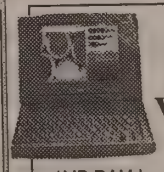

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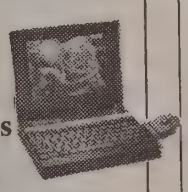

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INDUSTRY INSIGHT

Software Patents:

Stac Wins Suit Against Microsoft DoubleSpace To Be Removed From MS-DOS

BY PAUL HOFFMAN

Stac Electronics has won a major patent infringement lawsuit against Microsoft, forcing the giant software company to remove its popular DoubleSpace software from all versions of MS-DOS v6.0 and 6.2. As a result, new purchasers of MS-DOS will not be able to use the free disk-compression software.

Microsoft was also ordered by the jury to pay Stac $120 million for damages. At the same time, Stac was found guilty of using Microsoft trade secrets and was told to pay $13.7 million in damages to Microsoft. The case involved a software patent owned by Stac for a specific type of data compression.

The lawsuit will have a major effect on MS-DOS users who need more disk space. When DoubleSpace was first introduced in MS-DOS v6.0, it was one of the most highly touted features of the new version because it kept users from having to spend hundreds of dollars on compression utilities. Before v6, a few utility vendors such as Stac sold add-on products, but they did not always work well with MS-DOS. When DoubleSpace was released as part of v6, the market for other compression programs essentially disappeared and Stac was pretty much wiped out (Stac also sells a compression program for the Macintosh).

After the jury's decision, Microsoft released MS-DOS v6.21, which is the same as 6.2 but with DoubleSpace removed. All copies of v6.2 that had not been sold were recalled, and computer manufacturers were told to install v6.21 exclusively. Microsoft makes much of its MD-DOS profits from hardware manufacturers, and the change caught many of them off guard, especially manufacturers of portable systems, which typically have much smaller hard drives and thus rely more heavily on DoubleSpace.

Stac professed itself perfectly happy with Microsoft distributing v6.21 without DoubleSpace. Not only does Stac get a huge compensation for its lost market, that market will reopen for new sales to MS-DOS users. Of course, Microsoft can develop a version of MS-DOS with disk compression that uses a non-infringing method, at which point Stac will again have no market. In fact, many people in the computer industry wonder why Microsoft didn't use any of the many publicly available compression algorithms instead of the one they chose.

> When **DoubleSpace** was released as part of MS-DOS v6, the market for **other compression programs** essentially disappeared and **Stac was pretty much wiped out.**

Microsoft also made a point to assure current DoubleSpace users that they can continue to use DoubleSpace as they do already. As a consequence of Microsoft's payment of damages to Stac, Microsoft customers are essentially getting a paid-up license to the technology for whatever software they bought. Microsoft will also continue to support users who have problems with DoubleSpace through its technical support lines as it always has.

The small part of the suit that Microsoft won against Stac involves information that Stac learned during the beta test of MS-DOS v6. They used the method Microsoft was going to use to "pre-load" the compression driver. Stac claimed that this was an undocumented interface, while Microsoft successfully convinced the jury that it was a trade secret and stolen by Stac. Some software vendors are now worried that Microsoft will start prosecuting competitors that use undocumented interfaces that appear in beta copies, although it is likely that Microsoft simply used this tactic to try to scare Stac during litigation.

As you probably guessed, both companies will appeal the decisions against them. It is also likely that some of the jury's decisions will be changed by the trial judge or other judges during the coming months. The end effect on users should be negligible (except for Stac shareholders), but in the short term it will definitely make it harder for people who were going to rely on disk compression as part of new systems. Some manufacturers of portable computers are already talking to Stac about licensing their software for inclusion on systems with small disk drives, and others will simply make the user go out and buy a compression package.

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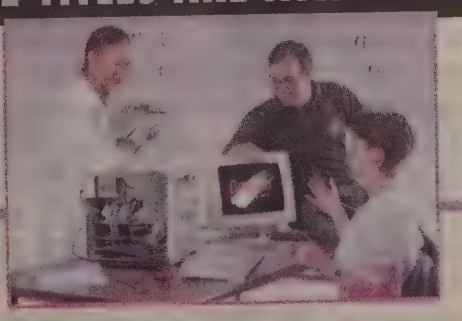

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CHEAP DOESN'T MEAN EASY: PORTABLE COMPUTERS IN 1994

Many major companies like Compaq and Dell are saying that the portable computer market will make them or break them this year. Almost every major PC company is releasing redesigned computers, often with lower price tags than last year. However, the manufacturers are finding resistance from the people who they hoped would buy the portables, and a major shakeout appears imminent.

It doesn't have to be that way. While price is important, it isn't the only thing that users look for when they buy a portable. Last year's spate of announcements of cheaper, faster, and less power-hungry CPUs has made it possible to shave 20% to 40% off the price of a portable system. Many computer manufacturers assumed that this drop in price would drive tens of millions of users to the portable market. Most have completely overlooked the other factors that are keeping many first-time portable buyers away—the screens, the trackballs, the ruggedness; in other words, the feel of the machine.

The PC market has long been plagued with a rampant me-too attitude about design. After all, most of what can be changed but still be considered part of the mainstream is just the design details, such as the feel of the keyboard, the location of the connectors, the shape of the box, and so on. For desktop systems, the design became less important than speed, disk capacity, and price. The same has never been true of portables.

From the beginning, the screens on portables have been hard to read. Although the LCD screens on today's portables are much better than those of five years ago, that isn't saying much. A system with an adequate screen can cost $500 more than a system with a bad screen, or 20% of the cost of the system. Now that color is almost a necessity for Windows users, the high-end portables all have expensive (but still hard-to-read) color LCD screens. Many people who don't have portables correctly suspect that using them is hard on the eyes.

Veteran portable users complain of many other strains as well. Due to the nature of the machine, the screen on all portables is just above the keyboard. This forces you to look down when you work, causing neck strain. Further, many portables (particularly the "subnotebooks," the lighter of the portables) have very cramped keyboards, adding wrist strain to the neck strain.

The worst design feature of most current portables, however, is the pointing device. Every trackball and slider has its advocates and its detractors, but few people who use both a portable and a desktop system prefer the portable for using Windows. The trackballs on many portable PCs are tiny, forcing the user to aim very carefully. Worse yet, some new designs put the trackballs in places that will strain the wrist even further, such as on the screen or on the edge of the computer. It is really amazing what some manufacturers are doing with the trackballs in the name of saving a few ounces or inches on the system.

You can see how little thought goes into the physical design of portables at some companies by comparing different models from the same company. For example, IBM's Ambra division has two system families, the SN (subnotebooks) and N (notebooks with larger screens). On the SN, the trackball is in the lower right corner; on the N, it is in the upper right corner.

So, why would someone want to spend $1000 more for a system that is physically difficult to use? For many people, portability is almost secondary to the fact that portable computers are also tiny. As people in the Los Angeles area now know, telecommuting is more than a fad. It can be the only way to work for many people. Yet few of these people want to devote an entire desk to a full-sized system, and a portable can be a blessing, even with the associated strain.

A few manufacturers are starting to look at the larger end of the portable market. Apple's PowerBook Macintoshes have generally been heavier, larger, and more expensive than comparable PC portables, and they are selling like crazy. A few daring manufacturers are testing out portables that are a few inches wider and taller than competitors, but do not weigh much more. They are putting the trackball in the same spot as Apple, right under the spacebar where your thumbs already are anyway. They are also testing better screens, even on their low-cost systems.

Price will always be an important factor, but speed may not. Now that manufacturers are starting to understand that communications are much more important than running a spreadsheet for most people, they may start selling systems that are not as fast but have great built-in communications capabilities. It is interesting how many manufacturers have shifted away from offering internal modems as standard equipment and then wonder why their sales are low.

It is also interesting to see how most advertising that shows portable computers in use show people on airplanes or in airports computing away happily. Few of us see these people when we travel; we see portables set up in conference rooms and at friends' houses. Astute marketers should consider showing portable users at home, using a plug instead of the short-lived batteries, with the computer hooked into the phone line. This year, bundling a portable with a good modem, and possibly Lotus Notes, may be the best way to sell systems. ■

While price is important, **it isn't the only thing** that users look for when they **buy a portable.**

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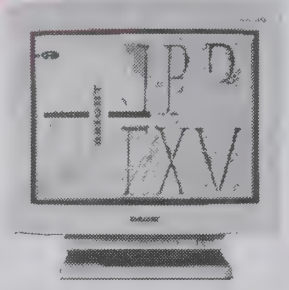

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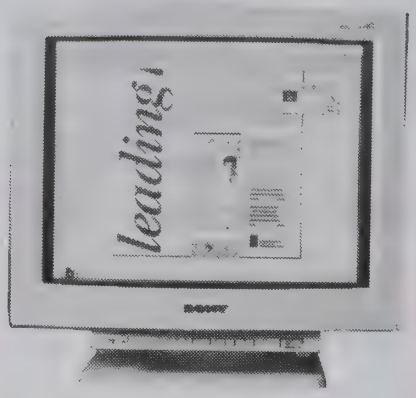

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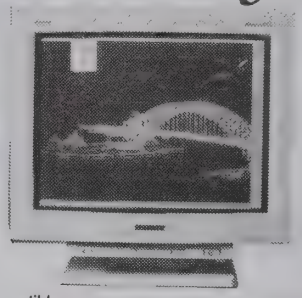

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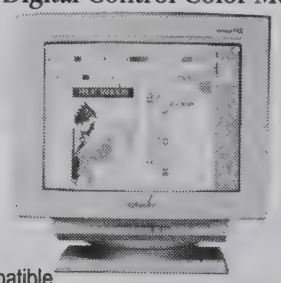

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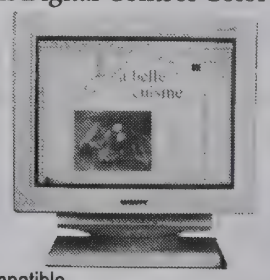

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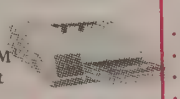

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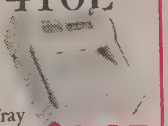

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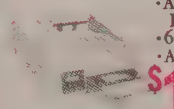

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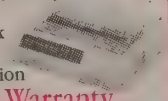

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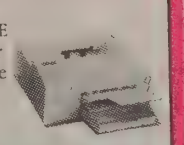

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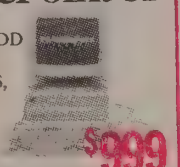

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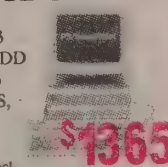

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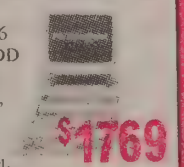

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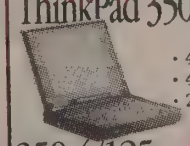

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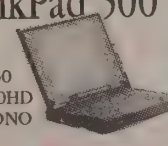

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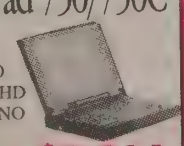

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continued from page 14

DOW RETREATS AS INFLATION FEARS PROLIFERATE

A bevy of economic news flooded the stock markets with inflationary fears. The Philadelphia Reserve Bank said raw-materials prices rose in January to the highest level since late 1990, although consumer prices remained unchanged. Some investors interpreted the Philadelphia report as a sign that the Federal Reserve Board may soon take further steps to raise short-term interest rates again. In other news, the US economy rocketed ahead at a 7.5% pace in the fourth quarter, much higher than the 5.9% initially reported. The possibility of excessive growth, coupled with a purchasing managers' report showing price increases in February, tailspinned the market.

For the monthly period ended March 4, the Dow Jones Industrial Average lost 39.12 points, or 1.01%, before closing at 3832.30. The Microtimes Stock Index fared much better than the Dow, as it jumped 7.47%, or 353.01 points, to close at 5081.75.

Lotus Development Corp. said it is meeting with American Telephone and Telegraph Co. on the possibility of working to build Public Notes Servers. Separately, the company expects to add 600,000 new users of its Notes communications package in 1994 to its current base of 750,000. The communications products, which enable the swapping of information among users on computer networks, constitute the software developer's most rapidly growing business. Consequently, Lotus was repeated as a "buy" by Furman Selz analyst Terence Quinn, who said the stock could rise to $80 a share. Shares of Lotus Development jumped $17.88 per share, the largest dollar gainer, before closing at $73.38.

AST Research, Inc., a manufacturer of a broad line of IBM-compatible personal computers, was downgraded to "neutral" from "buy" by both Dean Witter Reynolds analyst Eugene Glazer and Mabon Securities analyst Kevin McCarthy, over concerns about third-quarter results. Bruce Edwards, the chief financial officer of AST, told analysts that third-quarter earnings will fall below their estimates. AST shares closed at $24.00, down $4.75 per share.

Informix Corp., a Menlo Park, California, maker of computer database software, was raised to "buy" from "hold" at Saloman Brothers by analyst John Jones. Jones expects Informix to rise as much as $35.00 a share in the next twelve to eighteen months. The company also received a "buy" recommendation in new coverage from Furman Selz analyst Terry Quinn. In addition, fourth-quarter earnings increased to $0.27 a share, beating analysts' expectations of $0.25 a share. Informix earned $0.23 a share a year ago. Informix gained $6.63 per share, or 38.69%, to close at $23.75.

Dell Computer Corp. was raised to "attractive" from "neutral" by PaineWebber analyst Michael Kwatinetz and to a "strong buy" from "neutral" by Alex Brown & Sons analyst Steve Eskenazi. The company reported fourth-quarter earnings of $0.39 a share, compared to $0.77 a share, one year ago. Despite the decline in earnings, the results were above analyst forecasts of $0.32 a share. Dell shares soared $7.25 per share, or 36.35%, before closing at $27.25. ■

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 02/04/94	CLOSING PRICE 03/04/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
OTC	Adobe		ADBE	27.25	28.25	1.00	3.67	23	0.20	0.71	37.00	16.25
OTC	Aldus		ALDC	21.25	23.00	1.75	8.24	32	0.00	0.00	27.75	13.50
OTC	Autodesk	(H)	ACAD	48.75	60.00	11.25	23.08	24	0.48	0.80	60.00	37.00
OTC	Borland	(L)	BORL	13.25	13.38	0.13	0 94	25	0.00	0.00	27.25	12.00
OTC	Informix		IFMX	17.13	23.75	6.63	38.69	29	0.00	0.00	27.25	13.38
OTC	Lotus	(H)	LOTS	55.50	73.38	17.88	32.21	60	0.00	0.00	75.63	23.50
OTC	Microsoft		MSFT	81.25	81.00	–0.25	–0.31	24	0.00	0.00	98.00	70.38
OTC	Novell		NOVL	21.63	24.25	2.63	12.14	–	0.00	0.00	35.25	17.00
OTC	Oracle		ORCL	31.25	34.13	2.88	9.20	50	0.00	0.00	37.75	15.88
OTC	Software Publishing		SPCO	7.50	6 63	–0.88	–11.67	–	0.00	0.00	14.50	5.50
OTC	Symantec		SYMC	15.00	15.00	0.00	0.00	–	0.00	0.00	20.50	10.88
	HARDWARE											
OTC	Apple		AAPL	33.38	36.75	3.38	10.11	–	0.48	1.31	59.13	22.00
OTC	AST Research	(H)	ASTA	28.75	24.00	–4.75	–16.52	–	0.00	0.00	33.00	12.75
NYS	Commodore		CBU	3.13	3.25	0.13	4.00	–	0.00	0.00	5.63	2.50
NYS	Compaq	(H)	CPQ	85.25	98.88	13.63	15.98	18	0.00	0.00	101.88	43.13
NYS	Digital Equipment	(L)	DEC	29.13	30.88	1.75	6.01	–	0.00	0.00	48.25	27.75
OTC	Dell		DELL	20.00	27.25	7.25	36.25	–	0.00	0.00	39.13	13.50
NYS	Hewlett–Packard	(H)	HWP	81.00	89.00	8.00	9.88	18	1.00	1.12	93.63	64.38
NYS	IBM		IBM	52.00	52.63	0.63	1.20	–	1.00	1.90	60.00	40.63
NYS	Silicon Graphics		SGI	25.13	25.25	0.13	0.50	33	0.00	0.00	26.00	11.75
OTC	Sun Microsystems		SUNW	25.50	29.38	3.88	15.20	16	0.00	0.00	36.00	21.13
NYS	Xerox	(H)	XRX	95.00	97.50	2.50	2.63	–	3.00	3.08	103.25	69.88
NYS	Tandy		TAN	44.88	41.63	–3.25	–7.24	17	0.60	1.44	50.75	25.75
	CPU'S											
NYS	Advanced Micro Devices		AMD	20.38	23.38	3.00	14.72	10	0.00	0.00	32.88	16.75
OTC	Intel		INTC	61.75	69.63	7.88	12.75	13	0.20	0.29	74.50	42.75
NYS	LSI Logic	(H)	LSI	17.63	21.25	3.63	20.57	19	0.00	0.00	21.25	10.50
NYS	Motorola		MOT	95.25	104.75	9.50	9.97	29	0.56	0.53	107.50	59.25
	COMMUNICATIONS											
NYS	AT&T	(L)	T	54.88	51.38	–3.50	–6.38	17	1.32	2.57	65.00	51.13
NYS	BellSouth Corp.		BLS	56.63	55.00	–1.63	–2.87	26	2.76	5.02	63.88	50.63
OTC	MCI		MCIC	26.50	25.63	–0.88	–3.30	23	0.04	0.16	29.88	20.69
NYS	Northern Telecom		NT	30.38	30.63	0.25	0.82	–	0.36	1.18	46.00	21.38
NYS	Pacific Telesis		PAC	55.25	54.38	–0.88	–1.58	–	2.16	3.97	59.25	45.00

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MARKET DIARY:

ADVANCES	23
DECLINES	8
UNCHANGED	1
NEW HIGHS	7
NEW LOWS	3

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LARGEST DOLLAR GAINER	Lotus	$ 17.88
LARGEST DOLLAR LOSER	AST Research	$ –4.75
LARGEST PERCENTAGE GAINER	Informix	38.69 %
LARGEST PERCENTAGE LOSER	AST Research	–16.52 %

	CLOSE 02/04/94	CLOSE 03/04/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD
MICROTIMES STOCK INDEX	4728.74	5081.75	353.01	7.47
DOW JONES INDUSTRIAL AVERAGE	3871.42	3832.30	–39.12	–1.01
STANDARD & POOR'S 500 INDEX	469.81	464.74	–5.07	–1.08
N.Y.S.E. COMPOSITE	261.21	257.70	–3.51	–1.34
NASDAQ COMPOSITE	777.28	790.55	13.27	1.71

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10/18/93	4473.13	3642.31
12/17/93	4644.25	3751.57
01/07/94	4866.50	3820.77
02/04/94	4728.74	3871.42
03/04/94	5081.75	3832.30

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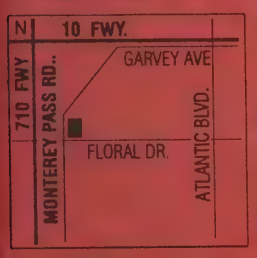

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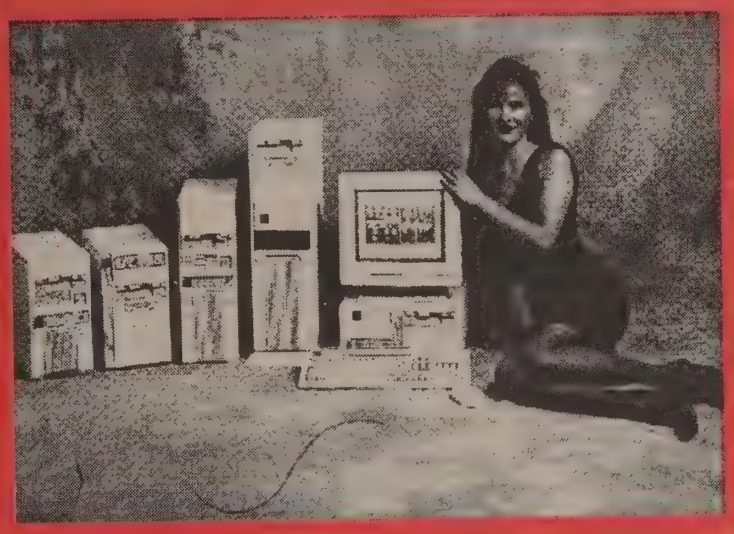

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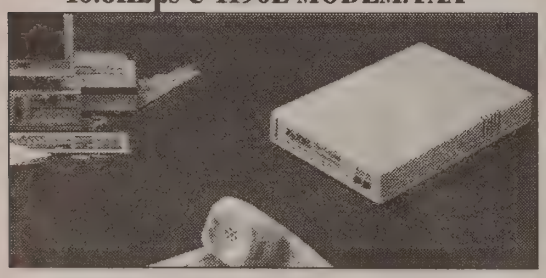

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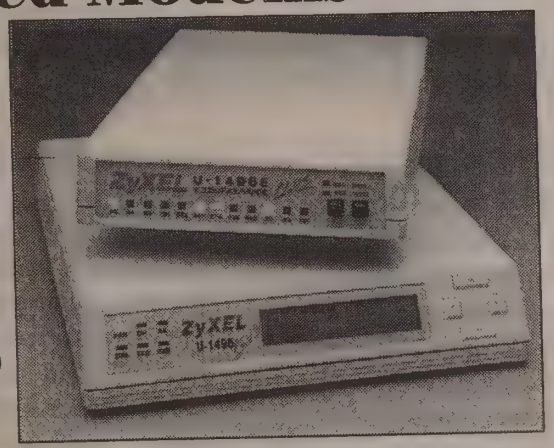

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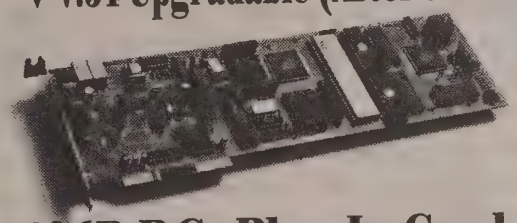

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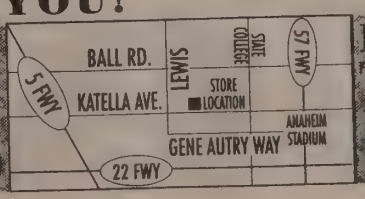

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Curing The Software-Monopoly Nightmare

BY JIM WARREN

This isn't a realizable fantasy—it's a realized nightmare! *The problem:*

If you design or write a computer-assisted business process, or spreadsheet macro, or command-line file, or pipe-'n'-filter combo, or wee-tiny object-oriented module—much less any actual subroutine or serious computer program—you better buy a lawyer or two.

Because any trivial problem-solving approach or intellectual process or programming technique you may think of may well be patented—or covered by a now-secret software patent application that won't hit you until years from now. For which you may pay and pay and pay, as a vile patent-infringer.

And ignorance of the long-hidden patent application is no excuse.

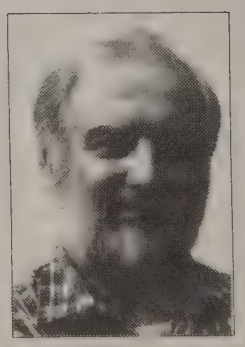
REALIZABLE FANTASIES

USERS ARE LIABLE; TRIPLE DAMAGES POSSIBLE

You don't have to *sell* patent-infringing software to be liable.

Simply *using* software that has any iota that infringes a patent makes you liable. Even when the patent is hidden for years, between being filed and being granted by the lawyer-controlled Patent and Trademark Office (PTO, 703/305-9300, fax 703/305-8885).

And you can be forced to pay *triple* damages if you "knowingly infringe"—that is, use a patented routine after you are informed that it's patented. Even if you have been using it for years and your business depends on it.



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THE SUITS ARE COMING! THE SUITS ARE COMING!

Software has long been protected by copyright and trade secret. No problem.

Then Lotus extended the limited principle of controlling right-of-copy to the much broader notion of "look and feel" in their litigation lunacy against underfunded Paperback Software—and destroyed that small publisher of low-cost software-in-a-book.

Furthermore, five years ago the US signed the Berne Convention protecting copyrights. It includes "moral rights" of the originator to control the "artistic integrity" of their creations; a right that cannot be waived. Just think of how the mind-monopolists will apply *that* to any routine any computer user dares to use.

Client-hungry intellectual-property attorneys are grabbing at the doorways of our minds. They are well on their way to placing toll-gates on our ability to write computer programs—with patents that monopolize anything that *works* like any patented procedure for seventeen years—or twenty years, if PTO Commissioner Bruce Lehman has his way.

COMPUTER-ASSISTED "BUSINESS PROCESSES" PATENTED

Software progress and leadership aren't the only things being threatened. "Business process" patents are being used to monopolize more and more business practices—*especially* those assisted by computer. Even when the software does little more than automate functions that have been done manually for many decades—or are business procedures that would have been done manually if people could move fast enough.

E.g., Merrill Lynch patented a "cash-management account" process for sweeping checking account funds into a higher-interest, market-rate fund, and returning them when needed to cover a check. Another firm patented computer-assisted annuity management practices that have been done manually for many decades.

FUNDAMENTAL PRINCIPLE

Traditional inventions enhance our *physical* capabilities—gadgets, physical processes, etc.—undoubtedly as envisioned by the Constitution's framers when they authorized patents "to promote progress."

But most software is fundamentally different: Software is what occurs between stimulus and response—with no physical incarnation other than as representations of binary logic.

Software mimics the mind. It enhances our *intellectual* capabilities.

And our ability to enhance our personal intellectual processes—with or without machine assistance—is just too precious to be monopolized. Not even for IBM and AT&T.

1. BAND-AIDS FOR THE CANCER

As long as the government continues to endanger the nation's fastest-growing industry, at least it can treat some of its more outrageous lesions:

- Immediately recall all software patents for rereview and possible revocation, since *numerous* patents were granted for obvious, nonnovel processes and ridiculously broad claims.
- Mandate disclosure upon filing or—say—within thirty or ninety days thereafter,

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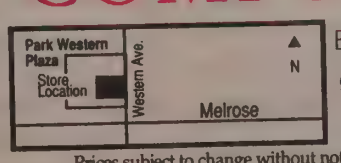

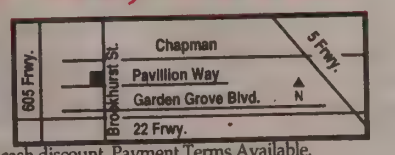

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like many other high-tech nations.

- Require disclosure upon filing of complete source code and complete internal documentation, since a major principle of patents is complete public disclosure by "best mode."
- Reject all applications filed after *any* public exposure, just like many high-tech nations (which at least might hinder vaporware).
- Instead of requiring "clear and convincing" evidence to invalidate a patent, have no presumption of validity at all, since the PTO grants software patents without access to the half-century of prior art.
- Reduce the protection period from seventeen or twenty years, down to, say, two years, recognizing software's short life, and low cost and high speed for reproducing and marketing it, unlike most *real* "inventions."
- Assign patent rights to the first-to-file, rather than the first-to-invent, just like almost every nation in the world—to at least get the threat out in the open, early—while retaining the principle that prior art *always* invalidates a patent.
- Declare that software processes and practices useful for communicating between a machine and a human cannot be monopolized (the "look and feel" idiocy).
- Mandate cross-licensing, limiting total fees to, say, 5% of the licensee's total profits

Software mimics the mind. It enhances our *intellectual* capabilities.

from the licensed tidbit, so the nation's software industry can *partly* continue its growth and vigor of the pre-monopoly half-century.

- Have the PTO build what it can of a limp-along prior-art database, nationally accessible via the Internet.
- Require that software patent examiners be technically literate in software.
- Create a large public advisory body of *technologists*—rather than lawyers—that communicates publicly via the nets, to help the PTO develop policies and *slightly* reduce its more bizarre software patent errors.

2. REDRESS OF OUR GRIEVANCES

It's clear that PTO Commissioner Lehman, a longtime DC lawyer and political activist, won't offend IBM, AT&T, and the like—much less the swarm of intellectual property attorneys leaping into the software patent feeding frenzy.

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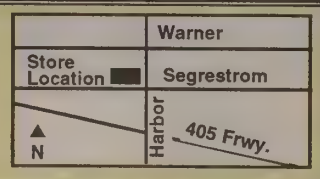

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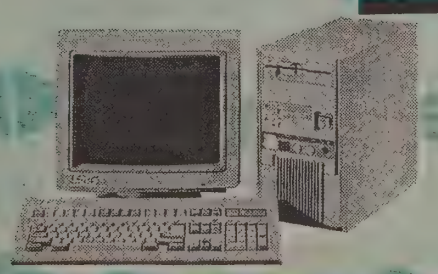

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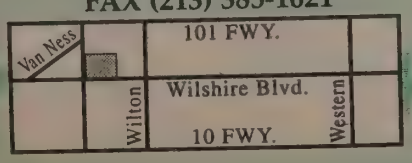

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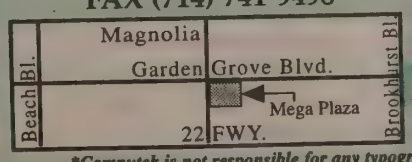

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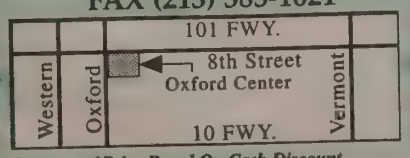

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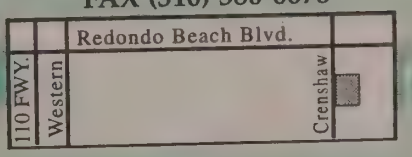

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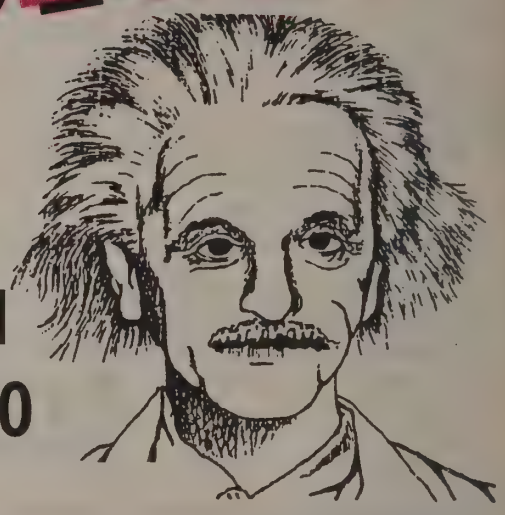

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tial tool—the Internet. To join in the common defense of our freedom to use programmable intellectual aids without paying ransoms to attorneys or via lawyer-bloated product costs, and to receive action alerts, send a one-liner to jwarren@well.sf.ca.us (which I may pass along to whomever leads the revolt).

4. MUTUAL DEFENSE TREATY

Individuals and companies that produce software innovation can pool their prior-art expertise, self-defense software patents, and other weapons for their—our—common defense, perhaps prohibiting access to enemies of programming freedom.

Principled innovators who obtain software patents as essential self-defense can refuse to license their use to anyone supporting software patents—and let's hope good folks patent some absolutely crucial techniques.

5. GUERRILLA WARFARE

Anyone can, uh, "help" IBM, AT&T, Microsoft, and other wealthy software monopoly advocates to understand the consequences of software patents and help invalidate many of them. Here's how:

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Anyone can review software patents and compare them to those companies' current products.

And anyone can send notices to said companies, detailing how they may be infringing various explicit patents. And to their major shareholders. And to Fortune 500 companies using their products. Sent by certified mail. With certified copies to the patent holders and to the PTO Commissioner. Perhaps with copies to the League for Programming Freedom (Box 9171, Cambridge, MA 02139; lpf@uunet.uu.net).

After all, shouldn't software monopoly advocates be the first to receive the "benefits?" ■

Warren organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991), was one of the first to receive the Electronic Frontier Foundation Pioneer Award (1992), led the recent successful effort to make state legislation and statutes available via the public nets without state charge, and received the James Madison Freedom-of-Information Award from the Society of Professional Journalists—Northern California (1994).

He is also an outside member of Autodesk's board of directors and, among other things, formulated their policy statement strongly opposing the patenting of software.

THE HORSE'S MOUTH

Jim Warren will speak about "Computer Software and Patent Issues" during the April 22 Patent-Office-at-Stanford conference at Stanford Law School; "Electronic Public Access to Government" before San Francisco's Commonwealth Club, May 5 at 5 p.m. (415/597-6700); and about civic networking in Apple's "Building Community Computing Networks," May 4–6 in Cupertino.

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Letters

More Political Grids On The Info Highway

Mitch Kapor ["From The Frontier," 119N/120S] concludes that government regulation, or threat thereof, will be necessary to "ensure universal access" to a National Information Infrastructure (NII). This assertion is both absurd and, more importantly, dangerous. It is absurd because it disregards history and lacks common sense. It is dangerous because a number of influential techno-types are beginning to try to make this notion a reality.

Mr. Kapor begins by stating that a goverment-built and controlled NII is undesirable, but one completely controlled by "oligopolies of enormous corporations" is equally undesirable. The only remedy, according to Kapor, is governmental regulation and legislation guaranteeing universal access. Unfortunately, Mr. Kapor fails to realize that only government can create and sustain such large oligopolies. Corporations, regardless of size, are always voluntary for an individual unless the corporation is given special treatment by government. Utilities, transportation, cable TV, telephone companies, and railroads have all fallen victim to this notion of "universal access."

Just what is universal access? Universal access to what? Does this mean a modem in every bedroom? A computer in every pot? Network TV is an excellent example of this ideal gone bad. Instead of paying the market price for a particular bandwidth, television stations keep their licenses for a nominal fee and must meet approval of the FCC. The criterion used, as set forth in the Act of 1927, is the "public interest, convenience, or necessity." In other words, a blank check on power which has guaranteed us the bland programming we have today.

However, the music industry provides a good example of what happens when there is no regulation. The industry is dominated by a few large majors (all of which are owned by companies that have benefited from government regulation). However, because there are no licensing requirements or guarantees of "universal access," thousands of independent labels exist. As a result, virtually any type of music can be purchased for reasonable prices. Software is another good example.

History has taught us that it is very unlikely that a universal system will develop for anything, be it information or healthcare, unless it is forced onto people by government. The media, government policy wonks, and anyone else who can get a sound bit all seem to share this dream of a vast information highway where everyone gets on board. What will be closer to reality will be a number of competing networks, all vying for business and offering different services. Maybe there will be a number of regional systems with a few large nationals like the phone companies. Perhaps large regionals and a number of small independents like supermarkets. No one can be certain, as it will always be changing—but one thing is certain. Any government regulation will result in a bureaucratic nightmare.

I agree with Mitch Kapor's hypothetical libertarian: Government should stay out of it and the "public interest" community should go home. Public interest, espeically in this case, is usually camouflage for collectivist-authoritarians. The only way the public's interest will be harmed is when the government, not the market, creates winners.

Kapor began his article with a modification of Karlgaard's grid. In actuality their grid should be a triangle:

The axes are not Authoritarian and Anti-Authoritarian, but rather Individualist vs. Collectivist. The lower right and left points represent methods of collectivism. Kapor goes on to explain that his group, EFF, is on the anti-authoritarian side. With policies like these, I think somewhere on the bottom half is more appropriate.

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PENS AND PALMTOPS

For many years pen computers have been relatively popular in Japan, even as they struggle to catch on here. Conversely, keyboards (on typewriters and then on computers), long popular in the West, have not gained quite as strong a foothold there.

Though personal computers are increasingly popular, one barrier to acceptance in Japan has always been the fact that the complex writing system used there (called "kanji" in Japanese, a system of pictographic writing which originated in China) has always made keyboards less convenient to use. In the past, for example, kanji typewriters were sometimes made with very complicated keyboards, with hundreds of keys, making them very difficult to memorize. Later, as computers became more sophisticated, simpler forms of data entry were invented, including translation from kana (phonetic letters) or romaji (Roman characters) to kanji; nevertheless, all are less straightforward than you might like. For this and other reasons, use of keyboards, and therefore computers, is still less universal in Japan than it is here.

By contrast, however, handheld and portable data storage units have been popular in Japan (often used as portable dictionaries, for example, to look up obscure kanji), and pen computers of all sorts have been prevalent there for some time as well.

I myself have not been to Japan for a number of years, but my curiosity in the subject was piqued recently when a friend of mine lent me a Japanese palmtop computer he'd purchased when visiting Japan in 1990. Since I write this column, he thought I might be interested to take a look at what the Japanese were doing in palmtop computers several years ago.

This unit he lent me is a Sony PTC-500. My friend doesn't actually understand a word of Japanese, but he was interested enough in the technology that he decided to buy one of these machines. He found the pictures in the manual to be explanation enough, apparently. My own Japanese is quite poor, but I was also able to make out the instructions well enough to get a good feel for the usability of the machine.

The unit is rather on the large side to be called a "palmtop"; closed, it measures 8" x 6" x 1 3/4"; more of an "armtop." But it is light enough to be carried on one "arm," and of course we're talking about 1990 technology; things were a lot bigger back then. In order to have the computing power capable of doing kanji character recognition, the machine had to be much more powerful than a Sharp Wizard or Casio B.O.S.S., which meant it must be comparatively larger and heavier; still, it comes with a convenient carrying case and is not unreasonably unwieldy. It is, of course, much smaller than the average notebook or even subnotebook computer.

The interface uses a "page" metaphor, much like the Apple Newton; you store information in pages, which scroll off as you finish your work. The pages scroll horizontally, not vertically, however, giving a "book" feeling (rather than a "notepad" feeling) to the interface. Icons at the top of the screen hold "desk accessory"-like tools, which include a calculator, a world time function, a phone dialer, a clock, and most importantly, a data entry tool, among other tools. Text entry is not free-form (like the Newton), rather, you enter text into pre-formatted squares. Each square can contain a number, letter, or Japanese character. This would at first seem a much more primitive interface than the Newton; however, considering the fact that a single character can be a whole word in Japanese, it's not quite as cumbersome an interface for Japanese writers as it is for English writers.

Now, my Japanese is extremely bad, and my handwriting is hardly passable. Like many Japanese-American children, I was sent to "Japanese school" for an hour a day after school; and, like most of these same Japanese-American children, I didn't learn much. However, despite my poor handwriting skills, the machine was able to easily recognize my name, written out in characters. In addition, there were a number of other ways to enter characters: for example, choosing characters from different kinds of menus and so forth.

One thing that was quite noticeable about the handwriting recognizer was that, like the Newton, the more complex the pattern, the easier it was for the unit to recognize it (because it was much less ambiguous). Ironically, this machine had the easiest time with those characters I found the most difficult to recognize.

One thing that makes the Newton particularly problematic is that, although it recognizes complex words very easily, it does not have a database of proper names and has a very difficult time with them. This, of course, is precisely the sort of thing that you want to use a personal organizer for. However, in Japanese, names are written as sequences of recognized characters; it would be as though in English people were named things like "Flower Child" (Hanako—a typical female name in Japan) or "Mountain Field" (Yamada—a common Japanese surname). Since the

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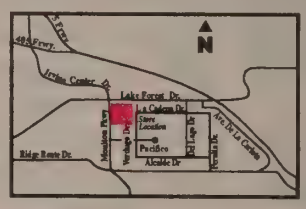

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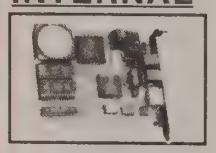

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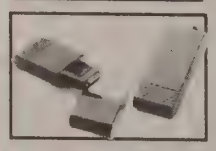

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(609)261-4800

Sony PTC-500
Sony Corporation
(201)930-SONY
1-800-222-SONY

names are made up of characters that form words, which can be recognized often with greater ease than phonetic characters, proper nouns are more easily recognized.

As a result, the Sony machine is better-suited for recognizing names, making handwriting recognition a practical interface for name/address database programs (provided, of course, you can remember the characters that make up the name, which is not always obvious even if you know the phonetic spelling of the person's name). This explains to a large extent, perhaps, why pen computers are now and continue to be popular in Japan, and why they have yet to take off here.

This is hardly an advantage for the Japanese, of course; the fact that pen interfaces are more well suited for Japanese writing is complemented by the fact that keyboards are comparatively cumbersome.

Wizard Expansion

Relatively disappointing sales of the Apple Newton, AT&T Eo, and Tandy Zoomer have prompted a number of manufacturers to reevaluate the usefulness of the traditional keyboard. Rumor has it that some new pen computers to be released later this year will include keyboard options, including Apple's next offering.

Of course, happy users of Sharp Wizards and other similar organizers could have told them that long ago; though keyboards are considered "hard to use" by some pen computing aficionados, many people are now realizing that for many tasks, pens are even more difficult to use. As with the mouse and keyboard, you might also want both in your portable computer; a keyboard for fast data entry, and a pen for drawings, diagrams, and user-interface control.

Consistent with this trend, PenWare, Inc. has announced that it's releasing a Sharp OZ-9000 Wizard version of the PenCell™ spreadsheet software. PenCell is available for a number of pen-based operating systems already, but this is the first offering on a portable organizer-class machine. Rather than focusing on a Newton or Zoomer version, PenWare has chosen to create one for the popular OZ-9000 Wizard organizer (which has a keyboard). Using the pen for manipulation of cell contents (allowing an intuitive drag and drop interface for data selection and movement) and the keyboard for data entry, the PenCell spreadsheet combines the best of both worlds in a compact package. PenCell is a full-function spreadsheet with graphics capabilities, and can add a tremendous amount of functionality to the OZ-9000. The card lists for $229.99.

Rupp Technology has released a Time & Expense Management card specifically for the Sharp OZ-9000 Wizard organizer. This allows OZ-9000 users to have a time/expense management card that takes advantage of the 9000's pen interface. The Time and Expense Card 9000 can organize your information by client, project, or service type/activity. It comes with a separate Itinerary Manager that keeps track of travel expenses, and a special foreign currency conversion calculator for added convenience. The price has not yet been determined, but the machine is slated to be shipping by the time you read this.

Also from Rupp Technology is FastLynx, a Windows-based PC-to-Wizard link program that will work with both the OZ-8000 and 9000 series organizers. FastLynx supports SDF, CSV, dBase, and other file import and export formats. It retails for $99 including link cable, or $39.95 without.

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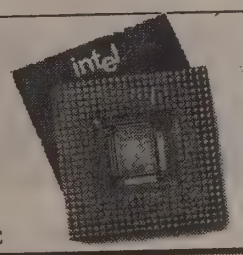

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Avatar Systems Corporation has created a 2.5" 85.4MB removable cartridge drive with a 14ms seek time. The drive is small enough to fit in many subnotebooks and even sub-subnotebooks; since it's removable-media, it's ideal for super-portable computers: when you want to quickly swap in or out some files or back up data from the internal hard drive, it can be done rapidly and easily to the removable cartridge.

PCMCIA News

•Coastal Electronics has announced the Little Drive III Plus, a PCMCIA card drive that attaches to PCs. The drive fits in a 3.5" floppy disk bay, and interfaces to your PC by emulating the standard floppy disk interface of your disk controller card. The drive retails for $179.95.

Because it does not use the parallel port of your computer, it has the potential to be much faster than similar devices that operate via the parallel port; however, we were not able to test the speed of the unit.

•Socket Communications has announced a few unusual and intriguing PCMCIA cards. The TRIO is a 14.4kbps fax, 14.4kbps modem, and a 10BaseT/10Base2 Ethernet card. This device saves a PCMCIA slot by combining two popular functions (faxmodem and Ethernet card) into one card. If your computer has only one slot, this could well be the right card to fill it.

The PageCard, another of their new cards, is an alphanumeric pager with a standalone LCD display. In addition to being a full-function autonomous pager, it also has a PCMCIA interface. The interface can be used to transfer data to your portable PC or palmtop and deliver messages to many popular email packages. Price for the PageCard will be less than $495.

Most fun of all, however, perhaps, is their Mobile GPS, a Global Positioning System receiver that receives free satellite positioning data and tells you your exact position and velocity, as well as giving you the current world atomic clock time. This receiver resides on a single Type II PCMCIA card, giving your notebook computer the ability to act as a navigational device most anywhere in the world. If you're out in the wilderness or out at sea (and happen to have your Type II PCMCIA-capable palmtop computer with you), you could use this card to give you exact longitude and latitude positioning information. Could come in quite handy out there in the wild. In the future, map software manufacturers could use this device in conjunction with their software to give you both precise location information as well as a map of your surroundings, all automatically.

Franklin Digital Book Pager

The Franklin Digital Book System is a small device used for information lookup and retrieval. It does not come with any organizer functions whatsoever; however, a large number of "digital books" have been published by Franklin, ranging from medical references to dictionaries.

In an interesting twist, SkyTel Corporation has created a pager card for the Franklin DBS-2, which will receive alphanumeric paging information. Franklin itself is also developing pager technology with special software that allows vertical applications to be developed with on-card databases (such as price lists), which can be automatically updated in the field via the paging network. ■

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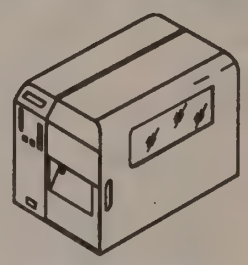

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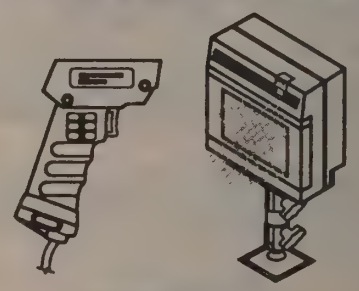

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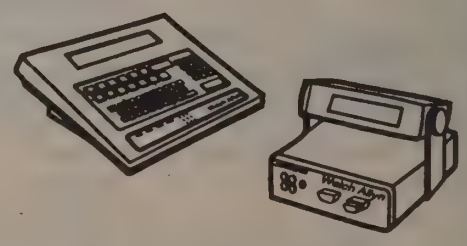

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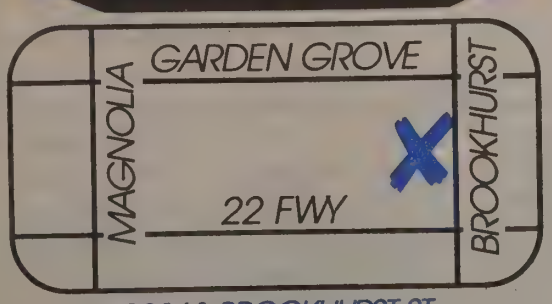

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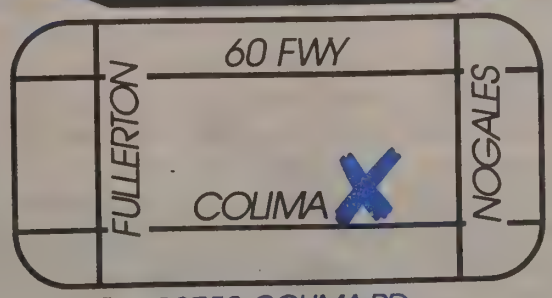

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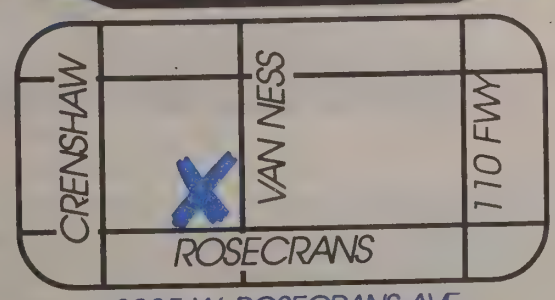

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Nanao's Green Monitor

The Flexscan F340i-W Offers Superb Ergonomic As Well As Ecological Features

BY ED KAHN

RESOURCES:

Nanao FlexScan F340i-W, $799
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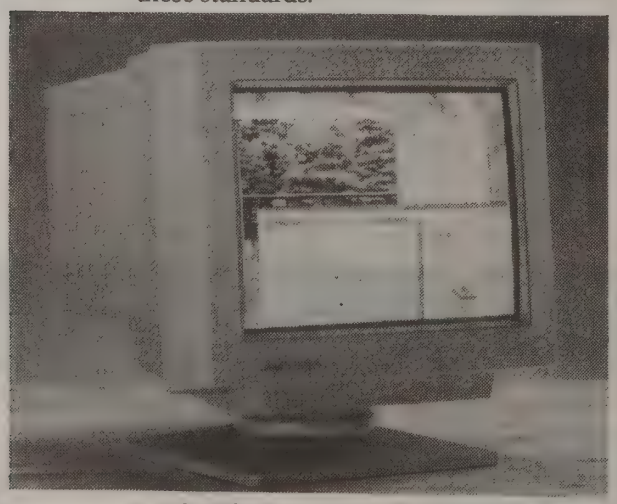
LAPTOPS

No matter how good your portable computer system is, if you have one primary work location—the home or office—as well as on-the-go, I still recommend a good color monitor. A decent size monitor makes life a lot easier, especially with Windows. While some people recommend a 17" screen for Windows, for general applications a 15" display works quite well.

Nanao has a 15" model that offers everything I could wish for in a monitor. Not only is the quality of the display excellent, but their FlexScan F340i-W incorporates highly sophisticated power management into the design of the unit.

Recently, the Environmental Protection Agency (EPA) developed the Energy Star Program, a volunteer partnership between the EPA and manufacturers of computer components. The program requires that during periods of inactivity the products will "power down" to less than 30 watts. This monitor meets these standards.



The FlexScan offers other features that make its use a dream. In the old days, for instance, both the external monitor and portable needed to be turned off to conserve power. Now, when I turn off the portable, the Nanao monitor powers down to a standby mode that uses only a trickle of power and is ready to go as soon as I return to the computer. But this smart monitor not only saves power when I turn off the computer, it also saves power during prolonged periods of inactivity. This is convenient for people who leave their systems on much of the time.

For the monitor to know when to shut down, you must have a screen saver. The one that comes with Windows works fine, but to add a little spice, Nanao includes a version of Berkeley Systems' popular After Dark collection of screen savers that has been customized for the Nanao monitor. After the screen saver runs for a user specified time, Nanao's EcoLogic countdown begins. During this period of time a different screen display is shown which advises you how long before the monitor will enter Power Manager Stage One. During Stage One, you can touch the keyboard or mouse and the monitor will spring back to life within a couple of seconds. Power conservation during this phase is over 90%. You can specify how long you want the monitor to stay in Stage One before going into the deeper sleep of Power Manager Stage Two. In this mode, power conservation is about 93% and it will take several seconds to awake from this state. When you turn your computer off, the monitor automatically enters Stage Two.

There is a lot more to this monitor than efficiency. Nanao has designed the FlexScan F340i-W with ergonomic as well as ecological features. The screen is flat, which reduces glare so that I no longer need to use a glare screen. Another feature I particularly enjoyed is a coating to keep static buildup from developing. And finally, Nanao has incorporated a number of design features to reduce electromagnetic emissions. The FlexScan F340i-W complies with the Swedish MRP II guidelines.

To make this unit easy to use, all of the controls are on its front except for the master power switch, which is seldom used. After you first turn on the monitor, it is unnecessary to turn its main power off, as the monitor effectively powers down by itself. One of the great features of this monitor is its ability to let you adjust the size of the image to fill the entire screen. Unlike some monitors that force you to lose a half or three quarters of an inch all around the display, the Nanao lets you adjust the display out to the edge of the monitor as well as center the image. The result is that you really get a full 15" display.

When you adjust all of the image details, including subtlety of color, you can instruct the monitor to remember these settings. If you subsequently use a different portable or application that requires different settings, the Nanao will save these settings as well, letting you easily switch between the settings as needed. All together, the monitor can remember up to twenty-eight different sets of settings.

The color adjustments are designed to let you match screen colors to color printer output, letting you view on the monitor what you will actually see in hardcopy. It is hard to imagine a more flexible system.

Resolution on the FlexScan F340i-W is excellent. The monitor will work with VGA or Super VGA, and resolutions up to 1024 x 768. It has a .28mm dot pitch. Of course, it is noninterlaced for flicker-free operation.

I never thought I would have to refer to the documentation for a monitor, but there are so many features to this unit that it is actually necessary to read the booklet in order to get the most out of the monitor. The instructions are clear and concise.

The list price of the Nanao FlexScan F340i-W is $799, and the parts and labor warranty has been extended to three years. You will have trouble finding a better all-around monitor to use with your portable. ■

This smart monitor not only saves power when I turn off the computer, it also saves power during prolonged periods of inactivity. This is convenient for people who leave their systems on much of the time.

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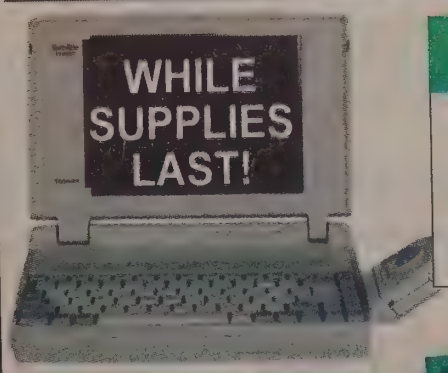

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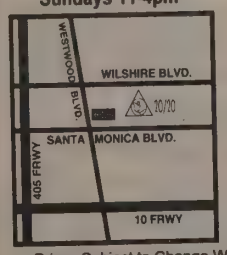

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LAPTOPS

COMPUTER OF THE MONTH:

Ambra N450C-200

For years, IBM has been playing catch-up in the world of laptops. Last year, they came out with a series of portables that rivaled any vendor. Finally, they had a really first-class product, but the price was pretty hefty for many users. The world of portable computer sales also changed during this time with the emergence of a host of high-quality vendors who were selling toprated portables through direct sales.

This change in the world of sales meant that excellent computers were available at heavily discounted prices. IBM studied the matter for some time and (for a surprise) decided that if you can't beat 'em, join 'em. They announced the formation of a new company to develop a wide range of PCs under the brand name of Ambra. These computers would be sold directly by Ambra and would not be available in retail outlets.

I looked forward to the introduction of these computers because the recent IBM offerings in the portable field had been so dynamic. I must say that Ambra still has a lot to learn. My first introduction to the company came in the form of a mailing I got, advertising a wide range of new machines. The only phone number given was an 800 number designed to take orders. I was completely unable to get through to anyone to speak about doing a review. The operator said she had no authority to connect me with anyone other than a sales representative. I left my phone number and never got a return call. Finally, I phoned a contact at IBM and told them the story. They were horrified and said that someone would call me. No call.

Ambra has included a local bus controller for the video output.

Eventually, I got through to the right person and they provided me with the laptop for this month's review. The Ambra N450C-200 is a pretty standard portable weighing in at 6.6lbs. It measures 8.5" x 11" x 2.25". It is powered by an i80486DX2 CPU running at 50MHz. It comes standard with 4MB of RAM, expandable up to 12MB. The standard configuration includes a high-density 3.5" floppy drive as well as a 200MB hard drive and two PCMCIA slots. The model I evaluated has a passive matrix color display. While this machine is powerful and has all of the features you need, I did not find it particularly exciting.

The most unusual feature of this laptop was its built-in trackball. While I prefer a mouse, I do appreciate a portable pointing device like the included trackball when I am on the go.

Ambra has done nothing wrong in the design of the N450C-200. Even though the keyboard is an excellent configuration with the cursor keys and the PgUp, PgDn, Home, and End keys just where you want them, Ambra recognizes that most users will want to use a full-size keyboard when they are in a primary location. To this end, they have included a PS/2 port on the back of the unit.

Likewise, they have made provisions for the addition of an external color monitor through the

Continued on page 73

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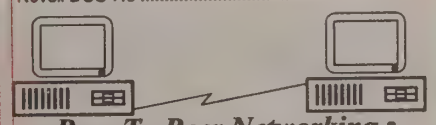

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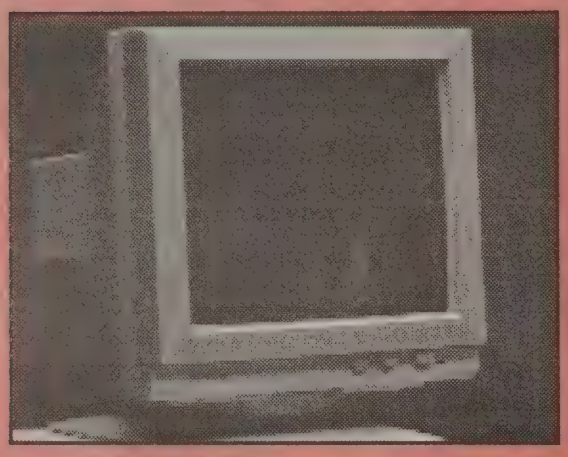

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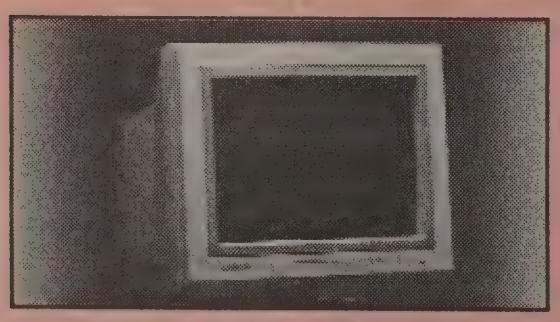

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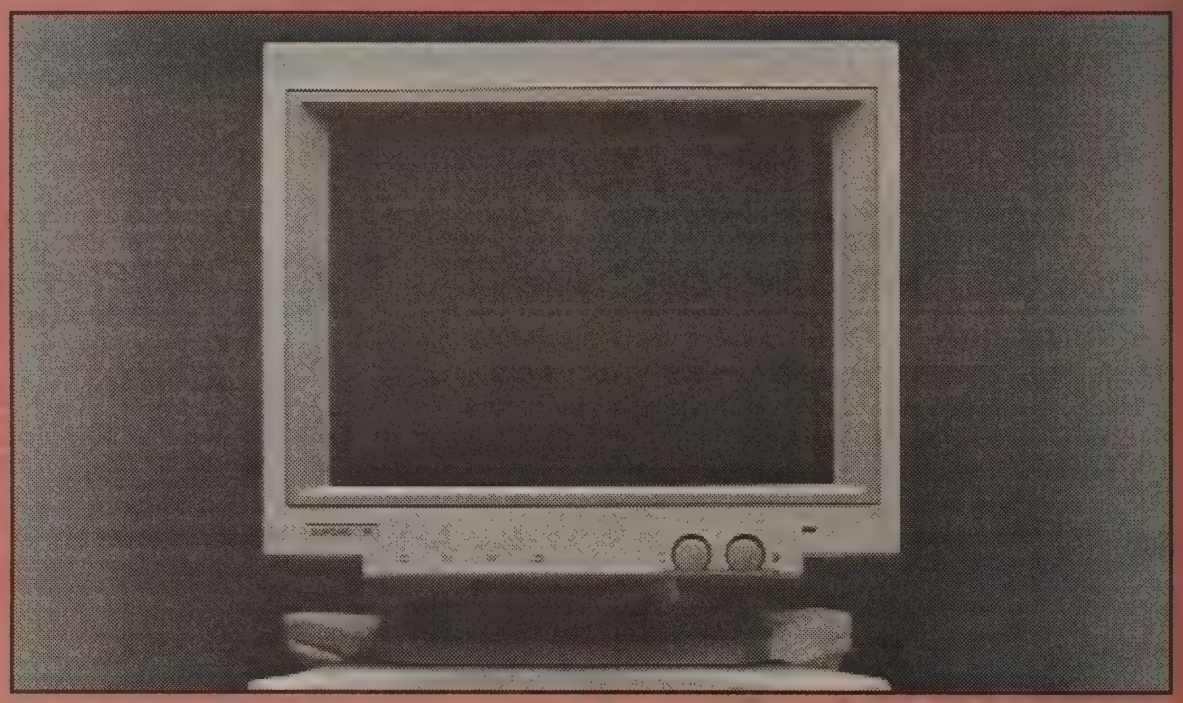

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Pre-Screening Telecommuters

Finding Strong Candidates For Your Company's Telecommuting Program

BY ROBERT MOSKOWITZ

As telecommuting continues to proliferate through California, the United States, and the world, it's important to keep in mind that telecommuting works best for certain types of activities and certain types of people. Activities that require a hands-on physical presence and people who feel comfortable only working in groups are less likely to benefit from or succeed at telecommuting.

It's important to have everyone who'd like to telecommute go through a fairly detailed screening process before they and their employer invest in the training, the workplace changes, and the equipment that might be needed to support the new telecommuter.

WHY TELECOMMUTE?

One of the first steps in screening a candidate is to get a full explanation of the reasons why this person wants to begin telecommuting. The wrong motivation, or mistaken expectations about telecommuting outcomes can create serious motivational and performance problems for the would-be telecommuter. Among the reasons offered by the candidate for telecommuting, you should find one or more of the following proven winners:

- To eliminate or reduce the time, cost, and difficulty of physically commuting to work.
- To allow longer concentration on important work projects.
- To allow greater flexibility in scheduling work time, and also in meeting special family needs, such as child- or parent-care, or as an alternative to temporary maternity leave.

WHY NOT TELECOMMUTE?

But just having the right reasons for wanting to telecommute is not enough. There can be many valid reasons why an eager and seemingly well-motivated candidate should not be allowed to telecommute. For a candidate to qualify, he or she should meet the following practical criteria:

- The candidate has enough room at home to set up a suitable workspace, or has an arrangement to telecommute from a suitable workspace in a commercially available site, in an "exchange" site approved by the company, or in a company-owned facility near home. If at home, the workspace is preferably one with a door or at least a curtain that separates it from activities going on in other parts of the home while the telecommuter is trying to work.
- The candidate is willing and able to provide whatever furniture, equipment, resources, and services may be needed to establish a suitable workspace from which to telecommute, including a private workspace and perhaps a dedicated telephone line. Naturally, the more the company can or will contribute, the less must be provided by the telecommuter.
- The candidate has won acceptance of his or her telecommuting schedule from workplace colleagues, subordinates, and supervisors, at least enough acceptance so that he or she will receive adequate support when trying to work away from the office.
- The candidate has also won acceptance of his or her telecommuting schedule from family members and others living at home, at least enough acceptance so that he or she will receive adequate support and privacy when trying to work away from the office.

PERSONAL CHECKLIST FOR TELECOMMUTERS

If the motivation is well founded and the practical situation is suitable for telecommuting, it's then appropriate to consider the individual's personal qualifications for adapting to this style of work.

In general, a person who will be successful at telecommuting shows elements of character and working style such as:

- Responsible and reliable, a person who has already established a pattern of delivering what he or she promises without falling back on lame excuses or recitations of extraordinary circumstances.
- Self-discipline and strong motivation to succeed both on the job and as a telecommuter.
- Self-sufficient, self-directed, and comfortable with the self-containment required of someone working in the more individual, isolated environment often experienced by telecommuters.

It's important to have everyone who'd like to telecommute go through a fairly detailed screening process before they and their employer invest in the training, the workplace changes, and the equipment that might be needed to support the new telecommuter.

Copyright © 1994 by Robert Moskowitz. All rights reserved. *Robert Moskowitz is a business consultant based in Woodland Hills, CA, who writes frequently on productivity, office automation, and technology. He is president of the American Telecommuting Association, a membership organization serving the needs of telecommuters and those who want to become telecommuters. He can be reached online at rmoskowitz@aol.com.*

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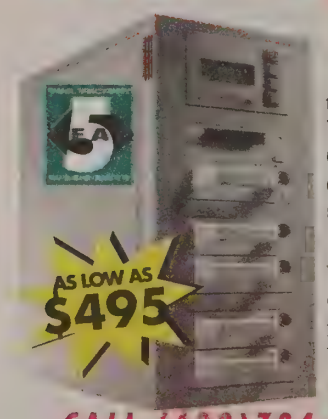

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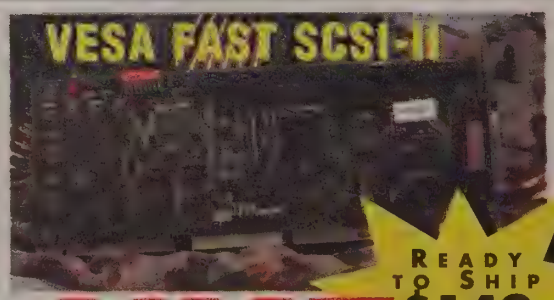

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JOB CHECKLIST FOR TELECOMMUTERS

Assuming the work environment is supportive of telecommuting, and the individual is personally a good candidate, the next important concern is that the work be suitable for telecommuting.

In general, work that can readily be accomplished by people working in the telecommuting mode is made up of:

• Reasonably discrete or separate projects, tasks, and activities.

• Individual projects, tasks, and activities that can be easily anticipated or accurately scheduled in advance.

• Relatively specialized projects, tasks, and activities that can be done away from the office.

• Individual projects, tasks, and activities that can be accomplished by an individual working alone, although they may require some communication with others over the telephone and other devices.

• Projects, tasks, and activities that generally result in some measurable results or specific deliverable.

SUPERVISORY CHECKLIST FOR TELECOMMUTERS

If all else checks out, it's critical to assess the support and motivation of the potential telecommuter's supervisor. Experience shows that without full cooperation from above, telecommuters have a very difficult time accomplishing their work and maintaining their role within the organization.

In general, a supervisor who can effectively and successfully support a telecommuter is likely to be:

• Comfortable with supervision at a distance, or at least open to the potential advantages of supervising people who are not physically in the office every day.

• Flexible in the management of projects, and oriented more toward top-quality results than concerned with seeing people put in long hours.

• A good communicator and motivator who recognizes that an employee has a full life outside of work.

• Concerned with empowering his or her employees, and able to communicate trust through a coaching mentality.

THE TRIAL RUN

Once a candidate for telecommuting passes the pre-screening process, it's often advisable for them to convert to telecommuting at first on a trial or project basis. This lets everyone find out in practice how well the candidate can work as a telecommuter, without requiring the organization—or the candidate—to make a permanent commitment.

For a trial run, it's possible to pick a relatively isolated or unique project, the success or failure of which may not impact greatly on other aspects of the telecommuter's job. For example, writing a specific proposal, analyzing a specific contract, or designing a specific project plan are all relatively "isolated" projects the fledgling

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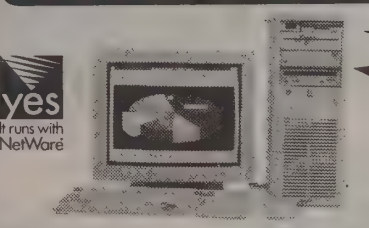

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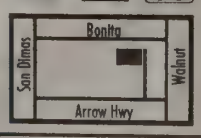

telecommuter can probably attempt as part of a trial run.

The trial run gives the new telecommuter the opportunity to make appropriate arrangements at home—particularly with family and with small children, and to test them out in practice. These arrangements should cover:

• Sharing with family members the nature of the telecommuting commitment, the goals and deadlines of the trial run project, and the days that one will be working away from the office.

• Working out with family members exactly what criteria to use in deciding whether or not to interrupt the telecommuter's work at home at a particular moment. For example, can a child expect Mom or Dad to stop working just to drive them to a friend's house? To make lunch? To answer a homework question? To change a diaper? With small children, it may be difficult to have a discussion or explain the nuances of when it is—and is not—appropriate to interrupt. But if the telecommuter is clear about these matters, young children and even babies will get the message through the consistency of the new telecommuter's actions and decisions. Telecommuters are generally not able to work productively and also take care of children—so separate arrangements should be made.

• Establishing rules about other family members using the telecommuter's workspace. Is the computer to be used for video games? Can someone take a pencil or tablet from the desk? Borrow the stapler? Suppose the regular home telephone line is busy and a teenager needs to make an urgent call? What if the business phone rings and the telecommuter is not around? Should someone answer? What should they say?

GOOD WORK HABITS

During the Trial Run, and afterwards of course, the telecommuter needs to know and utilize a set of work habits that have proven themselves to be most appropriate and effective in telecommuting situations. Briefly, these work habits include:

Good Pacing—It's important that the telecommuter maintain a steady rate of starting, moving forward on, and completing specific assignments and projects. Too slow, and productivity will drop. Too fast, and the telecommuter risks "burnout" or dissatisfaction that will prematurely end his or her career as a telecommuter. It's also important to take regular breaks throughout the day—perhaps one before starting work, one mid-morning, a lunch break, one mid-afternoon, and a post-workday break that serves as a psychological divider and refresher before the telecommuter launches into the responsibilities that generally appear at home around dinner time and later.

Good Scheduling—Telecommuting successfully requires somewhat better planning skills than working successfully in the office. The telecommuter must arrange to have access to people and other resources at the specific times when he or she will need them for specific tasks and projects. By contrast, generally these people and resources are available almost any time to workers operating in the office.

Good Organization—In addition to scheduling, it's important for telecommuters to keep track of resources—phone numbers, paperwork, computerized files, and so forth—so the resources they need each day can be brought to the location where they're working. It's also important for telecommuters to have a particularly clear sense of what they are trying to accomplish, so they can focus steadily on a few important objectives and produce meaningful results supporters and skeptics alike can readily appreciate.

Good Self-Discipline—The temptations not to work are far greater for the telecommuter than for the office-bound worker. It

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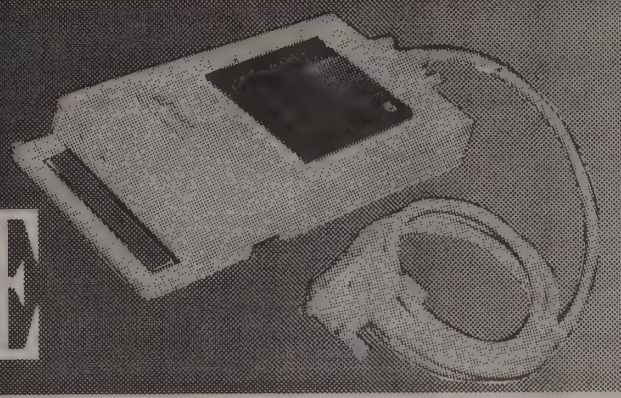

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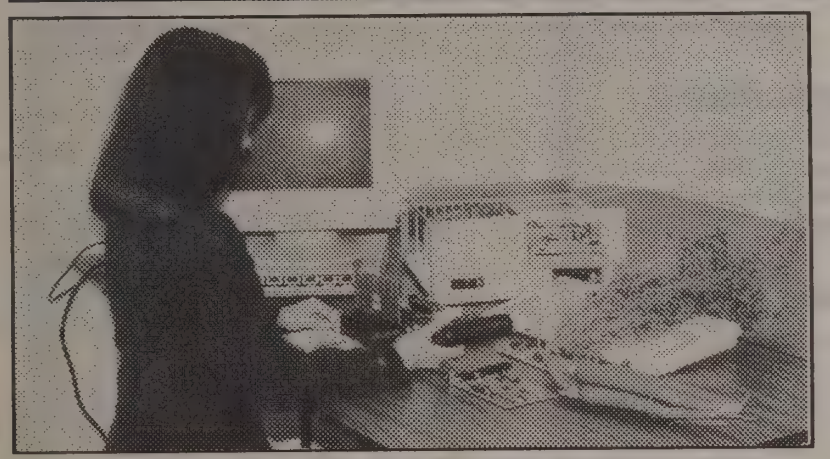

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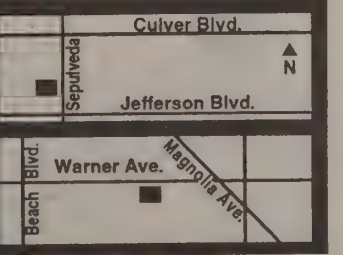

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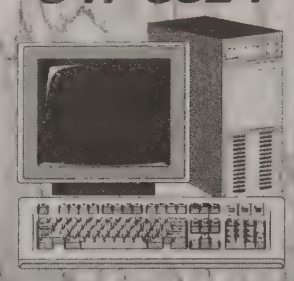

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takes a commitment to self-discipline to avoid such bad habits as: sleeping late, spending the day in your pajamas or nightgown, staying in bed or on the couch to work, letting the TV or radio distract you or absorb too much of your work time, taking too-frequent snack or meal breaks, and running errands or relaxing when you should be working.

Good Communication—Even though the telecommuter generally works separate and alone, he or she should make a strong effort to remain part of the team at the office. This means avoiding the temptation to switch tasks or restructure projects without telling anyone else, particularly when other people are counting on you to do things a certain way or complete a certain task by a prearranged deadline. The successful telecommuter spends a lot of time and effort processing the day's events with team members—reviewing ideas and activities, considering plans and future options, consulting before making decisions, and reviewing past actions to judge their impact and success.

Good Flexibility—Despite the need for planning, telecommuters must also maintain a degree of flexibility—enough to change telecommuting days to accommodate an important meeting that will occur in the office, or to give up a week or two of telecommuting to meet special demands for office-time, or even to work extra hours as a telecommuter to meet a suddenly accelerated deadline for results.

TAC'S TELECOMMUTING 2001

May 5–6, 1994, are the dates for the Telecommuting Advisory Council's first national (in-person) conference, entitled: Telecommuting 2001. It's slated to be held at the luxurious Pointe Hill Resort on South Mountain, in Phoenix, AZ. To receive a registration brochure, call (602)759-7883, or write the TAC National Conference, 3239 E. Cottonwood, Phoenix, AZ 85044.

TELECOMMUTE '94 CONFERENCE

October 1994 is the season for Telecommute '94, a high-level conference sponsored annually by Gil Gordon. In future articles I'll provide more information on scheduled speakers and the topics to be covered. Those interested in receiving word immediately can obtain an announcement and registration package by calling (908)329-2266 (or faxing: 908/329-2703). ■

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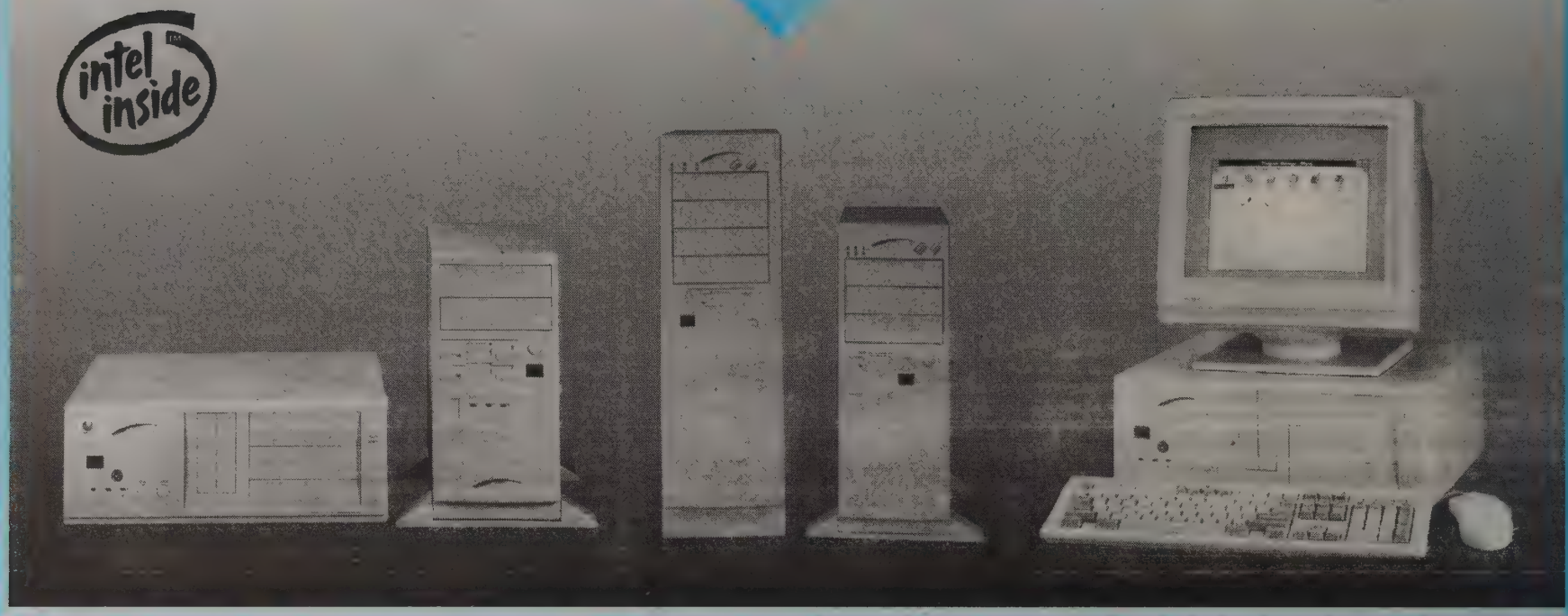

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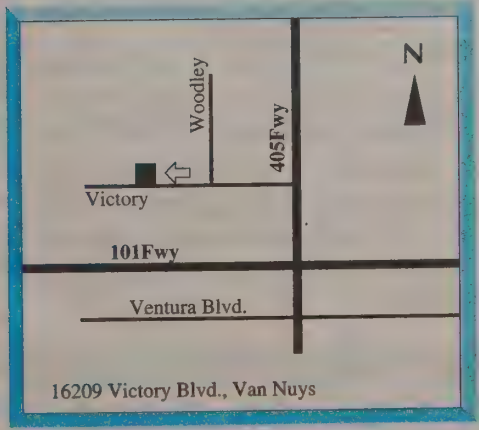

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LANs are continuing to evolve and change. In the mid-'80s, when LANs were introduced as departmental solutions for sharing printers and for word processing and spreadsheet files, "big iron" mainframes managed corporate databases and "mission critical" stuff. By the end of the '80s, some of those mission critical applications had migrated down to the LAN environment, and some smaller businesses were using LANs for all their computing needs.

Now, as LANs move into their second decade, they are being linked together—not just department-to-department, or location-to-location, but business-to-business. Microcomputer LANs are being used to run business applications once considered too large and complex for anything less than a mainframe, and LANs have expanded to include machines from different operating environments, combining PCs, Macs, UNIX systems, mainframes, even telephone equipment into a single coherent network. New technologies, ideas, and dreams of a national "data superhighway" continue to shape even small network environments. Perhaps a decade from now we'll still call it a LAN, or "local" area network, but the data we'll be sharing will come from across the country and around the globe.

In the months to come, I'll be talking about many subjects of interest to LAN users large and small, from next month's article on easy to set up networking hardware and software for your home or small business, to a look at heterogeneous networks where PCs, Macs, and UNIX systems all share data.

Copyright © 1994 by Peter Harrison. All rights reserved. *Peter Harrison, a San Mateo-based data communications and connectivity specialist, can be reached via Usenet (peterh@well.sf.ca.us) or CompuServe (74017,1716).*

NOVELL TECH SUPPORT ONLINE

If you've been putting off getting an Internet account, here's a good reason to stop procrastinating: Novell's tech support database will soon be available online.

Calling Novell's tech support line for help with NetWare is anything but cheap. If you're not a Novell Certified Network Engineer (CNE), it'll cost you $150 to ask even the most basic question (CNEs get help for $75), and while that money can go a long way—Novell won't close a call out until the problem is resolved and the caller satisfied—it's a steep price if all you need is a little help with some poorly documented facet of NetWare. Having free access to the database used by Novell's own tech support team can be a real money saver.

New technologies, ideas, and dreams of a national "data superhighway" continue to shape network environments.

Novell's tech support database is a World Wide Web (WWW or Web) hypertext-based system, and it's fairly easy to use. There is a catch, though. To take full advantage of a Web database, you'll need a browser, the graphical interface for Web. Very few NetWare administrators probably have access to a full-featured browser. For those who do, you can access the database at URL hhtp://www.novell.com/. Be forewarned that this is a new service at Novell, and there are bound to be changes. Also, to use this graphical, hypertext resource you'll need node-level connectivity to the Internet—a dial-up terminal connection won't work.

With a standard dial-up Internet connection, a network administrator has access to many useful resources. Novell has the entire contents of NetWare, an assortment of user programs, Novell patches, and product enhancements available via the Internet, at ftp.novell.com. For those who need a little more help finding the Novell resource they want, there is a text-driven gopher server at gopher.novell.com that will help you find the files you need. Either of these two resources would be a good place to go if you need a specific Novell file, such as the latest NetWare client software for MS-DOS 6.2 DOSUP9.

Novell isn't the only source of networking wisdom and useful programs on the Internet. There is an Internet newsgroup, comp.sys.novell, where Novell network users ranging from beginners to old hands ask and answer questions, and make observations about the networking industry. The newsgroup is a great place to get help troubleshooting a problem on your LAN, setting up new LAN resources, or when you're trying to select the right hardware or software for your needs. It is one of my first stops before I buy new networking hardware or software and I need opinions from people who already have experience with the prod-

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- 1.2MB & 1.44MB Floppy Drive
- 250MB Hard Drive
- IDE VESA LB
- 4MB RAM
- Cirus Logic Vesa LB 1MB
- Super VGA 1024x768 Color Monitor .28
- 101 Keyboard
- Mini-Tower Case
- Serial Mouse

$1294

486DX2-50 VESA LOCAL BUS

- Acer 486DX2-50 MHz, 256K Cache, Novell Certified
- 4 MB RAM
- 1.2MB & 1.44MB
- 250MB Hard Drive
- SVGA 1MB Card
- Super VGA 1024x768Color Monitor .28
- 101 Keyboard
- Mini-Tower Case
- Serial Mouse

$1319

486DLC-40 VESA LOCAL BUS

- Acer Motherboard w/Cyrix 486 DLC-40 MHz VESA LB, 128K Cache with Math Co-Processor
- 4 MB RAM
- 1.2MB & 1.44MB Floppy Drive
- 250MB Hard Disk
- SVGA 1MB Card
- Super VGA 1024x768 CTX Color Monitor .28
- 101 Keyboard
- Mini-Tower Case
- Serial Mouse

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486DX2-66 VESA LOCAL BUS

- Acer 486 DX2-66 Vesa LB, 256K Cache, Novell Certified
- 4MB RAM
- 1.2 & 1.44MB Floppy Drive
- 250MB Hard Drive
- IDE Vesa LB
- Controller
- Cirus Logic Vesa LB 1MB
- Super VGA 1024 x 768 Color .28 Monitor, Non-Interlaced
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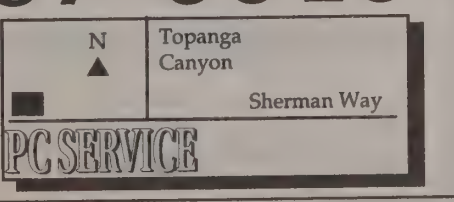

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- 32-Bit VL-Bus Windows Accelerator Card (1MB Exp. to 2MB 1280 x 1024)
- 250MB IDE HDD
- TEAC 1.2 & 1.44MB FDD
- 14" Shamrock .28 NI Monitor
- Euro Series Mini Tower or Desktop w/230W UL Listed P/S
- 101 Key Keyboard
- Mouse & Mouse Pad

CPU TYPE	PRICE
Intel 486DX-33	$1250
Intel 486DX-50	1410
Intel 486DX2-66	1450
AMD 486DX-40	1225
AMD 486DX2-50	1295
AMD 486DX2-66	1380

IBM SLC2-66VLB System

- IBM 486SLC2-66MHz VESA Local Bus w/CPU & Math Coprocessor
- 64K Cache Expandable to 128K
- 4MB RAM
- VL-Bus IDE I/O Card
- 2 Serial, 1 Parallel, 1 Game Port
- 32-Bit VL-Bus Windows Accelerator Card (1MB Exp. to 2MB 1280 x 1024)
- 250MB IDE HDD
- TEAC 1.2 & 1.44MB FDD
- 14" Shamrock .28 NI Monitor
- Euro Series Mini Tower or Desktop w/230W UL Listed P/S
- 101 Key Keyboard
- Mouse & Mouse Pad

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Novell isn't the only source of networking wisdom and useful programs on the Internet.

ucts I'm looking at.

There are also archives of computer programs that a LAN administrator might find useful cached all over the Internet. One of my more recent finds is ETHLOAD, a very basic protocol analyzer that will work with most ethernet cards. ETHLOAD is great if all you need to do is figure out how heavy a load an ethernet network is taking, and who is taking the most bandwidth. ETHLOAD can help improve your network's performance by giving you statistics on how much of your network bandwidth is being used, when usage peaks, and who uses the most bandwidth. Armed with this information, you can make intelligent decisions on when to split your network into two parts, and who to put on each "subnet" so that the network load is evenly distributed. Best of all, ETHLOAD is free, as are many of the programs available on the Net. To get a hold of a copy, just use the Internet's file transfer protocol, ftp, to retrieve ETHLD104.ZIP from oak.oakland.edu.

Perhaps a decade from now we'll still call it a LAN, or "Local" Area Network, but the data we'll be sharing will come from across the country and around the globe.

There's a lot of information available on the Internet, and other people in your office may someday need access to one of the many resources available there. Using the Internet to keep in touch with fellow professionals, business partners, customers, and friends has become a business necessity at many companies. Other Internet resources range from Bureau of Census tract information and the text of recent Supreme Court decisions to information on astronomy and astrology, and how to maintain your LAN.

The Internet may be coming to a LAN near you, so, if you're not familiar with the Internet yet, perhaps you should start now. Taking a look at these LAN-related resources on the Net may be just the place to start. ■

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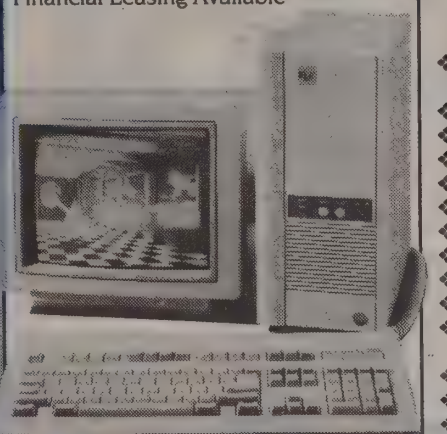

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- 1.2MB TEAC Floppy Disk
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486DX-50 MHz
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(up to 128MB)

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- **Motherboard made in the USA**
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- **420MB** Conner Hard Disk
- 1.2MB TEAC Floppy Drive
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- ZIF Socket, Intel Overdrive Ready
- 3 VESA Local Bus Slots, 5 ISA 16 bit slots
- Motherboard Made in the USA
- CPU Cooling Fan
- **8MB Memory (up to 128MB)**
- **420MB** Conner Hard Disk
- 1.2MB TEAC Floppy Disk
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- VESA IDE, 2 Serial, 1 Parallel, 1 Game
- VESA 1MB Video Board
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RG-58 50 Ohm Terminator	$2
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RJ-45 Wire (per foot)	$.15
Bulk 1000 Feet RG-58 Cable, UL Standard	$99
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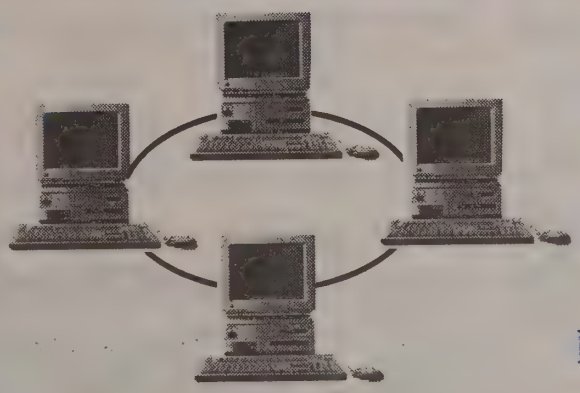

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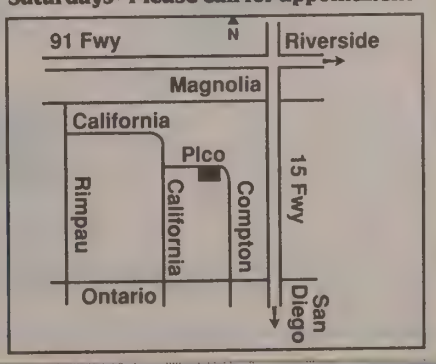

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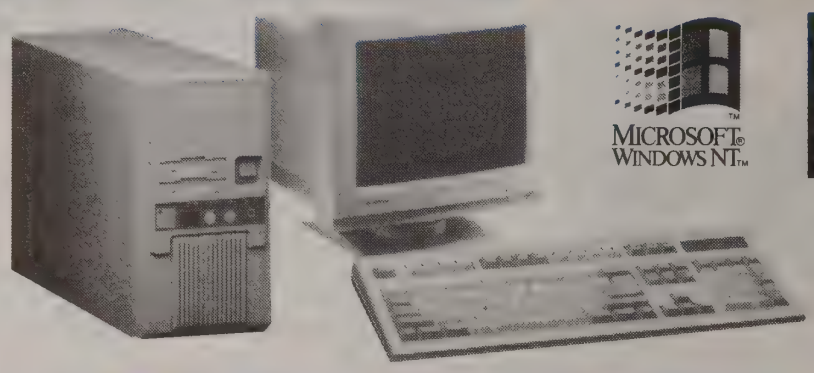

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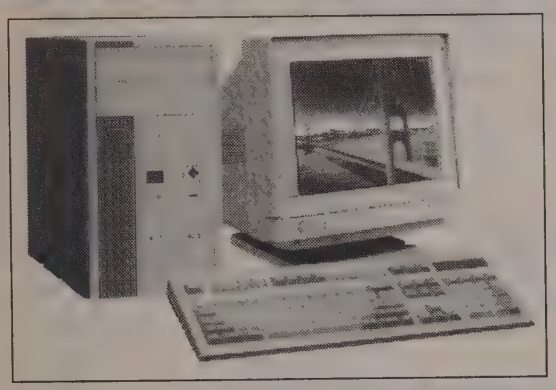

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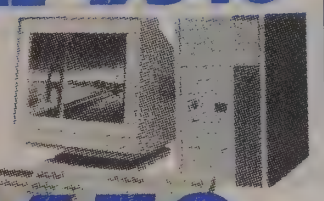

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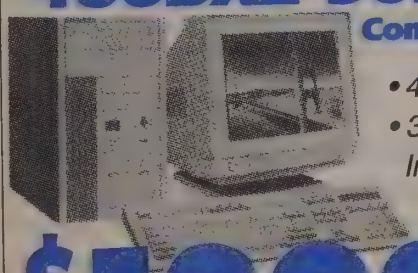

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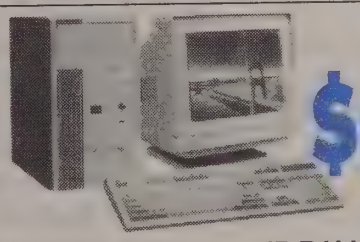

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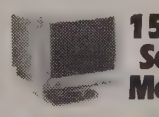

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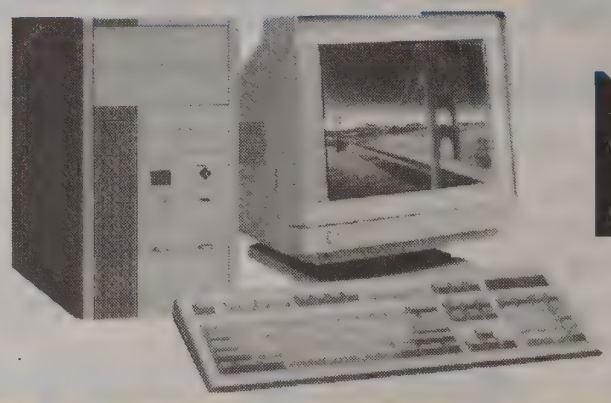

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• Pentium processor • 60 MHz • 64-Bit data path • 8 MB RAM (128 MB maximum) • 512 KB processor cache • 3.5 inch 1.44 MB diskette drive • Sony 2x CD-ROM drive • 1 Gig, 12 ms hard drive SCSI • 4 ISA, 3 Local Bus slots • 6 storage bays • VESA graphic accelerator, 1MB DRAM • 17 inch Flat Square NI .26 color monitor • Mini-tower casing • 200 watt power supply • MS-DOS 6.21, Windows 3.111 • MS Mouse • Space-saving 101 key keyboard.

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What do people really want when they talk about being "on the Internet"? The recent barrage of major stories in publications such as *Time*, *Fortune*, *US News & World Report*, the *New York Times*, and other newspapers form the basis for what many new users know about the Internet. From those stories, it often appears as if the Internet is mostly a confusing place where you can communicate with people, which is accurate as far as it goes.

When people come to our consulting firm asking to get on the Internet, typically about 80% of them are most interested in being able to send and receive electronic mail. That's easy to accomplish, since mail is the most common service both on the Internet and elsewhere.

To be accurate, maybe I should say that's what they think they want. Because most of what is available on the Internet is sufficiently different from what is found on other networks, such as FidoNet, UUCP, BITNET, CompuServe, or BBSes, these services are hard to understand without using them.

A look at file transfer capabilities helps illustrate this point. Many PC users have transferred files between a pair of machines, or used several hundred databases on a conferencing system. The existence of thousands of file repositories on computers spread around the world, accessible as if in the next room, can easily sound like an unusable fantasy. But it exists, mostly through FTP, the File Transfer Protocol.

RESOURCE SHARING ACROSS THE NET

File transfer is one type of resource sharing available across the Internet. Another is remote access to library catalogs and other specialized databases. Catalogs for the Library of Congress, the Bibliotheque Nationale, hundreds of university libraries, and others, are accessible through the Internet. The protocol most used for this is TELNET, which also permits someone with an ordinary login account on a remote system, across town or the world, to connect via the network and log in there.

More than five hundred databases on the Internet support keyword lookup. A popular protocol for this is WAIS, Wide Area Information Servers. Recognizing that working with various protocol interfaces can be difficult, and that users like menus, the Internet Gopher addresses both problems, providing a coherent front end to TELNET, FTP, and WAIS, among others, along with files and directories presented directly through Gopher as menus.

Another approach to a unified front end is WWW, World Wide Web. While Gopher is built around ASCII interfaces, WWW uses a bitmapped screen. Where Gopher provides whole files and directories by name, WWW uses hypertext to handle smaller pieces of information in addition to whole files and directories.

TYPE OF CONNECTION

An Internet user can access resources provided by others, and can also offer resources for others to use; this means that an Internet user can be a producer as well as a consumer of information.

The type of access to the Internet partly determines the user's ability to provide information. Many people will discover they already have access through their company's IP network. Some Internet connectivity providers sell individuals or organizations direct access, connecting a host or a LAN with IP to the rest of the Internet. This method offers the fullest range of capabilities, making all services available, all the time, and directly to the user's machine. In addition, the user can run servers that anyone else can access at any time.

Direct access is also the most expensive option. If the user does not already have a direct connection, or the user's organization wants a less expensive solution, dialup IP access is also an option. Many of the same connectivity providers offer it. The user is still able to use all of the Internet services directly, but it will now be more difficult to provide services, since the connection is intermittent, and the user's machine may not be accessible when a remote user wants it. More obviously, dialup links are usually slower than direct connections.

An even less expensive option is to connect through a login host. These are computers that provide accounts accessible by modem dialup. A user can use all Internet services (assuming the login host supports interfaces to them all), but the user is really working on the host computer, not theirs. Thus, to retrieve a file from a remote system, the user can use FTP to transfer it to the login host. But to get this file to their machine, the user must use Kermit, zmodem, or some other dialup modem file transfer protocol, at modem speeds.

Login hosts are the source of one of the most persistent false myths in the press

An **Internet** user can be a **producer** as well as a **consumer** of **information**.

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these days: that the Internet is a UNIX network, and that you must learn UNIX shell commands to use the Internet. Actually, the Internet's TCP/IP protocols are implemented on just about every computer software and hardware platform in the world. PCs and Macintoshes are found in hordes on the Internet. Free IP software is available for such machines, and using it with dialup IP access presents the Internet services through native interfaces on the user's machine. Mac users can point and click. MS-DOS users can use function keys. Users who want more sophisticated or more reliable IP software can buy it from companies like FTP Software for DOS or InterCon for Macintoshes.

MAIL DELIVERY SERVICES

Resource sharing isn't everything. Electronic mail is not only the service most new users ask for first; it is also the Internet service experienced users use the most. They use it to coordinate projects, discuss work, chat about food, romanticize, and philosophize. At Internet speeds, mail arrives in seconds, and conversations by mail are common.

Mail can also be addressed to a mailing list—sending it to a mail alias that software recognizes and forwards the message to all of the people on an established distribution list. Tens, hundreds, or even thousands of people can discuss anything this way; there are thousands of established lists. Lists are somewhat like newsletters, and somewhat like letters to the editor columns, but different; plus, each list tends to develop its own character.

Larger groups tend to form around USENET newsgroups. These are organized discussion topics where one copy of each message is kept per news server, rather than one copy in each individual's mailbox. This small difference permits great increases in efficiency, and therefore the ability to let larger numbers of people read and/or post to a single newsgroup. Of the more than five thousand major newsgroups, thirty-three of them have more than one hundred thousand readers each. More than four million people read news worldwide, both on the Internet and on other networks, such as UUCP, BITNET, and FidoNet.

Electronic mail is not only the **service** most new users ask for **first**; it is also the **Internet** service **experienced users** use the **most**.

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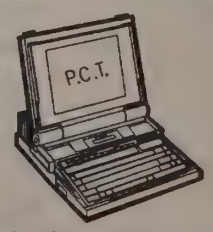

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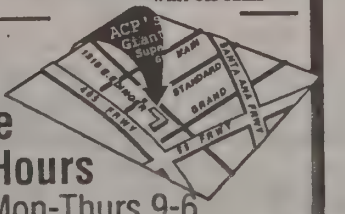

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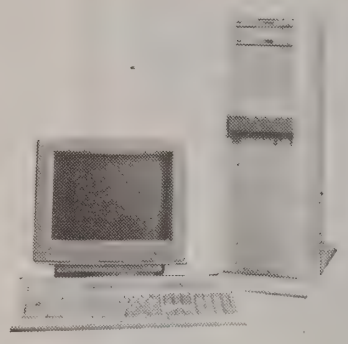

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WHAT IS IT ALL ABOUT?

New Internet users will like other services, such as IRC. But the main point of the Internet is not any specific service. The main point is not even the variety and sophistication of Internet services. It is what they can be used for: collaboration. While writing a paper or report, you can search assorted repositories across the world, often communicate directly with the people who provide them, retrieve background material, locate potential coauthors, pass drafts including text and graphics back and forth, and even publish the final copy, if you wish. And you can do this at a speed limited mostly only by the people involved. You don't have to order a document and wait a day for it to arrive by overnight courier, and you don't have to pay the courier. If you do your own research, you may find your job finished in a day or even hours.

It's true that many pieces of information are not yet available over the Internet, and many people you want to reach do not yet have access. But the Internet can often help you find them faster.

As of October 1993 there were about fifteen million people on the Internet, and the number has been doubling annually for the past five years. If the current growth rate continues, there will be thirty million Internet users by October 1994; roughly equal to the population of Canada. Users range from ranchers in Montana to students at every major university in North America, Europe, and the Far East, to capitalists in Moscow; from the president of the US to troops and aid agencies in Somalia; from Melbourne to Cape Town to Buenos Aires. Currently the Internet reaches fifty-nine countries.

Looked at as a nation itself, this network offers many things—a marketplace, a workplace, a source of entertainment. That's the Internet. ■

John S. Quarterman is editor of Matrix News, *a monthly newsletter about contextual issues crossing network, geographic, and political boundaries, and is secretary of Matrix Information and Directory Services, Inc., of Austin. Quarterman is senior technical partner of Texas Internet Consulting (TIC), which consults in networks and open systems, with particular emphasis on TCP/IP networks, UNIX systems, and standards.*

He is the author of The Matrix: Computer Networks and Conferencing Systems Worldwide, *Digital Press, 1990, and coauthor of* The Design and Implementation of the 4.3BSD UNIX Operating System, *1989;* UNIX, POSIX, and Open Systems: The Open Standards Puzzle, *1993;* Practical Internetworking With TCP/IP and UNIX; *and* The Internet Connection: System Connectivity and Configuration, *1993, Addison-Wesley.*

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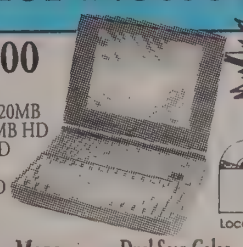

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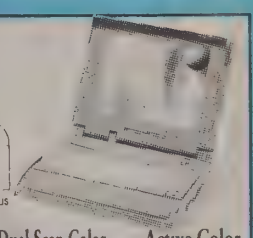

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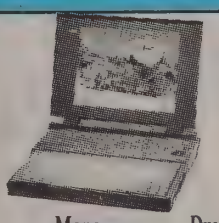

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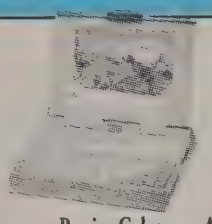

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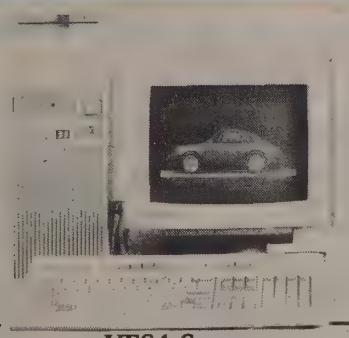

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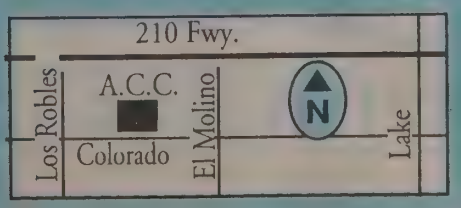

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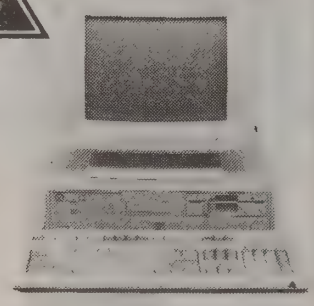

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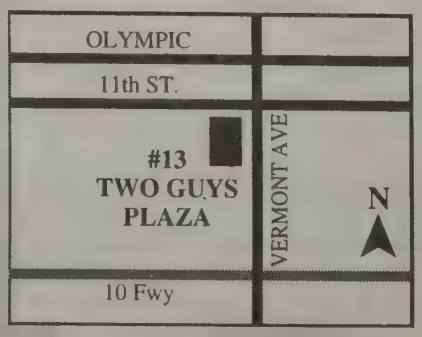

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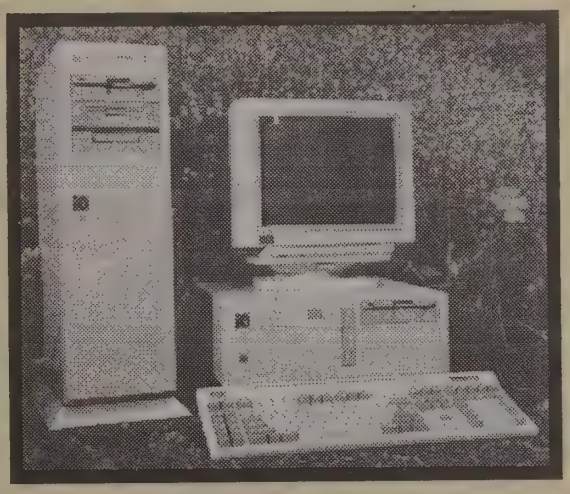

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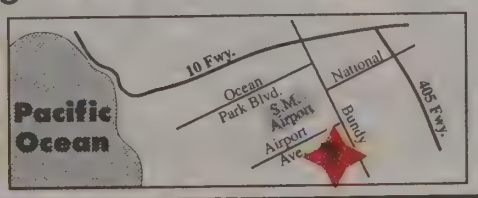

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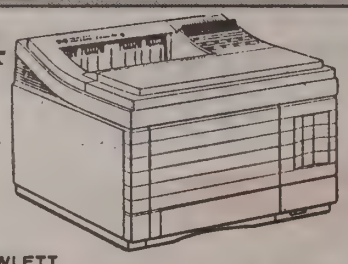

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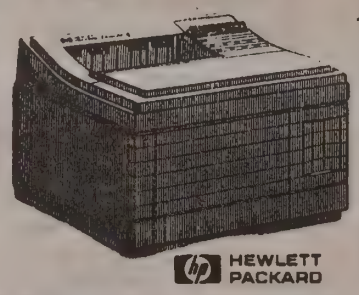

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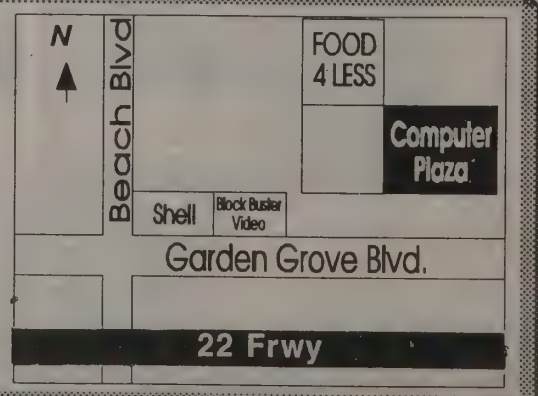

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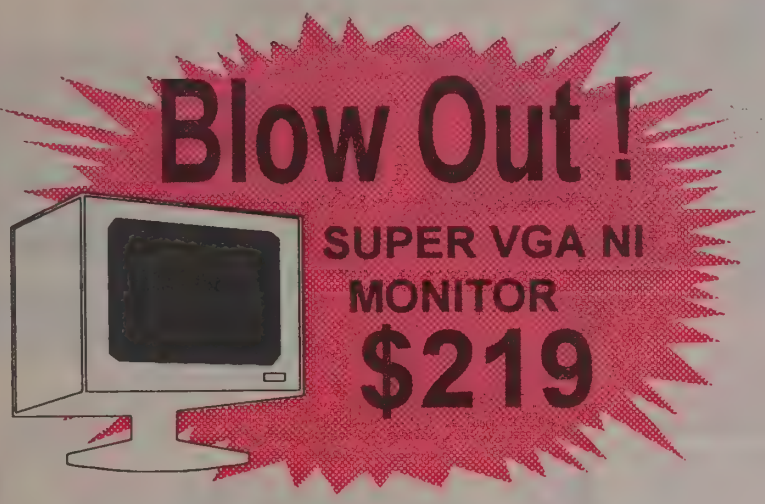

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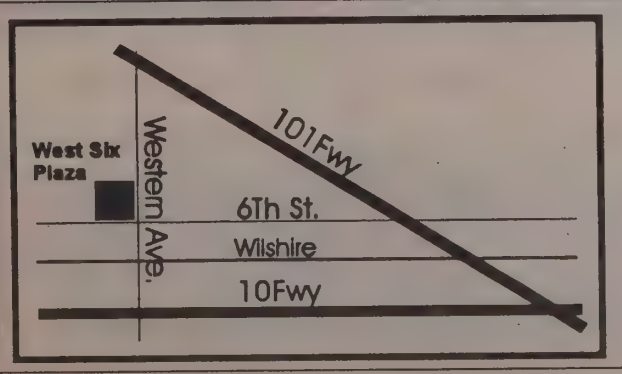

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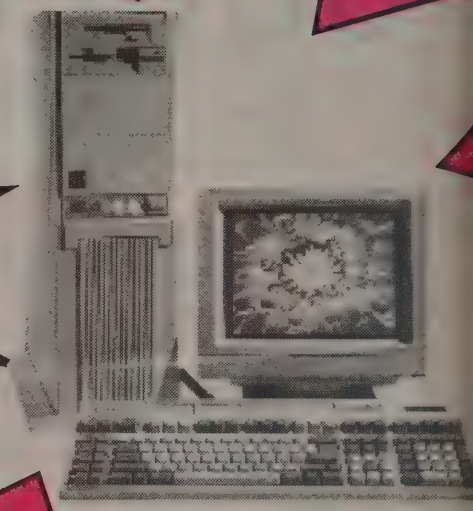

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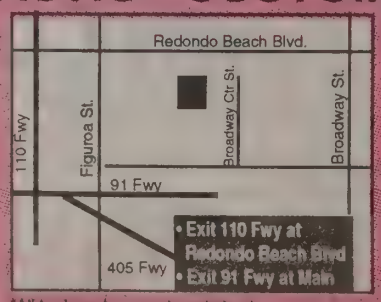

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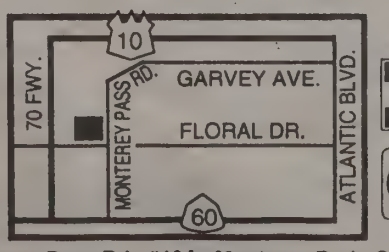

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Continued from page 38

You can also elect to use both the internal and external monitor simultaneously.

RESOURCES:
Ambra N450C-200, $2599
Ambra Computer Corp.
3200 Beechleaf Ct.
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27604-1063
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inclusion of a video port on the back of the computer. Interestingly enough, Ambra has included a local bus controller for the video output. This makes for a faster system. If you use an external monitor, you can use either a VGA or Super VGA model. You can also elect to use both the internal and external monitor simultaneously.

The Ambra N450C-200 operates on either AC current or from the removable, but included, battery pack. It will normally provide about two hours of operation. Recharge time is roughly the same. Extra battery packs ($89) are available. Sophisticated power management software and hardware are included. A hardware Power Management Unit automatically lowers the operating speed from turbo to standard whenever it is not processing an instruction.

There is both a serial and a parallel port. A PCMCIA Type III slot allows you to install two PCMCIA Type II cards. Ambra offers a variety of PCMCIA fax/modems ranging in price from about $200 up to $349 for a 14,400Kbps model.

A docking station ($499) attaches to the back of the unit. This gadget will hold four expansion cards—two standard 16-bit cards and two VESA local bus cards. Ambra sells an "Instant Office" package ($927) that includes the docking station, a 15" color monitor, and a full-size keyboard.

Ambra provides a one-year warranty and a 30-day, money-back guarantee. My reservations about the system are based more on Ambra working out the startup problems of a new company than on the product itself. The N450C-200 has everything you will need, including both DOS 6.2 and Windows 3.1. Never underestimate the power of Big Blue to get its act together. ■

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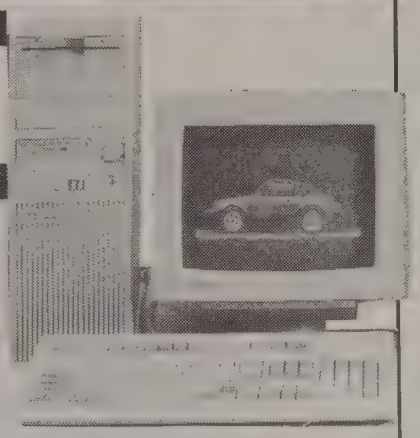

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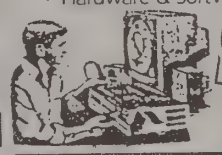

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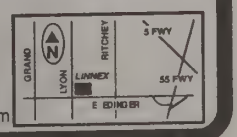
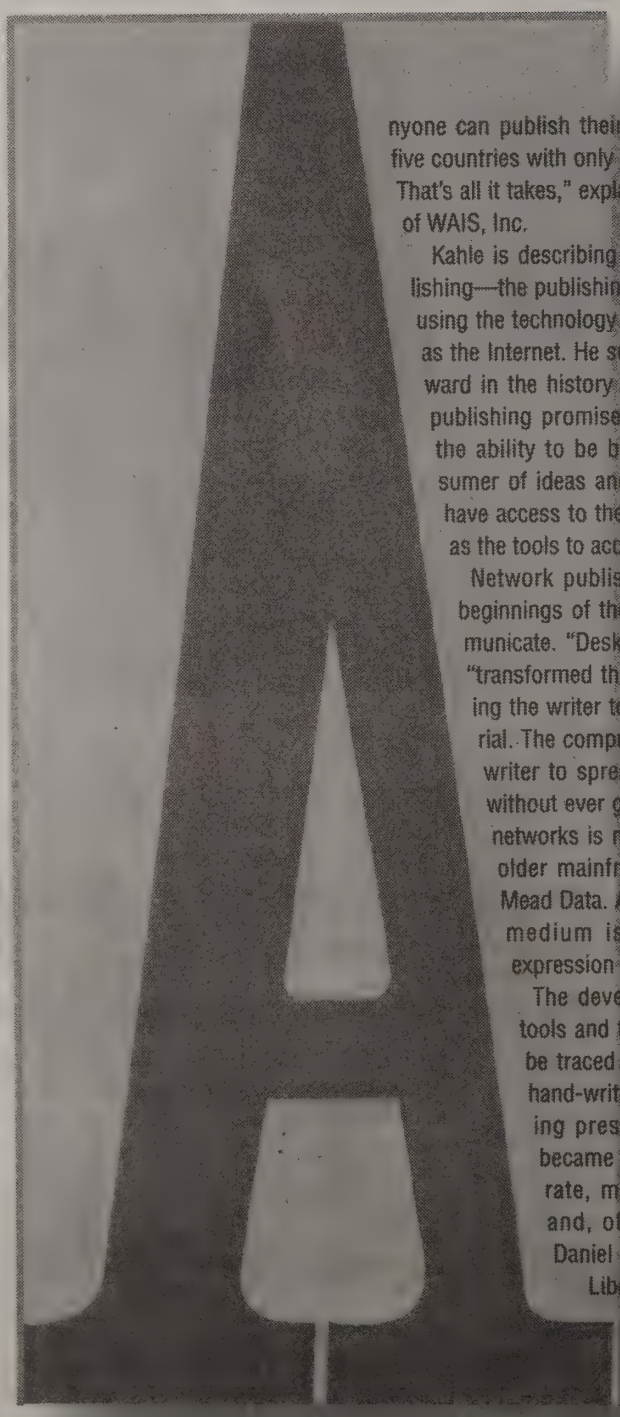


WAIS
—a new vision for publishing

By Michael Robin
Photos By Anne Knudsen



Anyone can publish their "words to people in forty-five countries with only a computer and a telephone. That's all it takes," explains Brewster Kahle, founder of WAIS, Inc.

Kahle is describing what he calls network publishing—the publishing, or dissemination of ideas, using the technology of wide area networks, such as the Internet. He sees it as a quantum leap forward in the history of communication. Network publishing promises to give virtually everyone the ability to be both a publisher and a consumer of ideas and information. Everyone will have access to the tools for publishing as well as the tools to access published information.

Network publishing can be viewed as the beginnings of the next step in how we communicate. "Desktop publishing," says Kahle, "transformed the publishing world by allowing the writer to make 'camera ready' material. The computer networks now allow that writer to spread their words far and wide without ever going to paper... Using these networks is much cheaper than using the older mainframe systems like Dialog or Mead Data. All in all, the new inexpensive medium is creating a new type of expression on the net."

The development of communication tools and their impact on societies can be traced from oral communication to hand-written manuscripts to the printing press. At each step knowledge became "more portable, more accurate, more convenient to refer to, and, of course, more public," as Daniel J. Boorstin, librarian for the Library of Congress, points out in *The Discoverers*. The consequences of making knowledge "more public" is fundamental to a democratic society. Thomas Carlyle, English essayist and historian, observed in 1863 that: "He who first shortened the labor of copyists by the device of movable types was disbanding hired armies and cashiering most kings and senates, and creating a whole new democratic world."

The information contained in the early manuscript books was unorganized by today's standards—there were no indexes, punctuation, or even page numbers. The advent of the printing press precipitated an explosion in the amount of knowledge available throughout society, but for many decades there was no useful system for archiving or cataloging these books. All of this combined to make retrieving information difficult.

Similarly, the information available on the Internet today is usually plain, unformatted text, scattered across servers around the world. Searching, retrieving, and sometimes even reading these digital documents often requires familiarity with UNIX commands and other technical jargon. The volumes of information available on desktop computers across the Internet has given renewed meaning to the term "information overload." And until recently, the only way to locate a specific document was to already know exactly where it was—which server, directory, subdirectory, and the file name.

Brewster Kahle is one of the people developing ways to improve access to and retrieval of published documents. First at Thinking Machines and then as founder of San Mateo-based WAIS, Inc., he helped create WAIS, Wide Area Information Servers, a remote search and retrieval resource for networks such as the Internet. WAIS is one of several relatively new resources on the Internet that seeks to help users navigate online to provide and/or find information. Kahle hopes that WAIS will help lay the foundation for transforming the way we communicate.

I met with Kahle to discuss what WAIS software is, how it works, WAIS, Inc., and his vision of network publishing.

As more and more people are getting on networks and large corporations are building private enterprise networks, better tools for navigating and searching the nets are becoming available, tools such as gopher, WAIS, archie, Web, etc. Putting WAIS in context, how does it fit into this puzzle?

WAIS is one of the tools that are being used now on the Internet. There are three really wildly popular ones—gopher, World Wide Web, and WAIS. If you think about this as what we're constructing is a large network book, gopher is the table of contents, a hierarchical browsing approach. World Wide Web is hypertext pages. It's the realization of Ted Nelson's dream, in terms of technology, of clicking from one page to another, jumping to author to author to author. WAIS is the back of the book, the index. It's the place you turn when you know what you want. WAIS is trying to help people search through gigabytes of information that's located in hundreds of locations around the world.

To use gopher you don't need to know particular sites or where the information is on the nets, but for WAIS you need to know specific locations.

It's a two-step process with WAIS. One, you have to find the data source that you want to look through. There are directories that help you find the right data collections, whether it's a poetry server or weather server, whether it's a genetics database in Singapore or the IBM PC frequently asked questions server in Mexico City; you have to find which of those you want to use.

You ask the directory of servers a question. Say you're interested in how to hook up your IBM PC to an Ethernet network You'd ask the question, "I'm trying to hook up my IBM PC to an Ethernet network," to the directory of servers. Hopefully there will be some descriptions of databases that have some of those words and phrases in them and they'll be suggested back to you. There may be four or five databases that will have information on IBM PCs.

You would then select one or several of them and pose your question to those databases, which can be located anywhere around the world. You don't care where the servers are. You use a server the same way you'd use it as if the data were on your own local machine, and it all works at pretty much the same speed. You can search through gigabytes in just a few seconds no matter where it is in the world.

The idea is that you actually ask your question in the English language, like the example, "I'm trying to hook up my IBM PC to an Ethernet network." The servers don't understand what you're saying. They're just trying to find documents that have those words and phrases in them. If the words and phrases exist exactly, as in your question, the document receives more weight. If it's in the headline, it receives even more weight. The list of documents are ranked and the top ones come back at the top of the list. The server says you might want to look at these. You can browse them, then by clicking on them, retrieve the information you want.

You can also say, "I like that one. Find me more like that one." WAIS uses the server again by getting this positive feedback from the user. It knows a lot more what it is you are interested in. It can use a document as a big search term to find other similar documents.

What is the Directory of Servers?

The WAIS software indexes all the words and phrases in each document so that you can find appropriate documents. A "Directory of Servers" is a database of descriptions of servers and a major one is operated by Thinking Machines. This can help find appropriate servers to use.

We hope that the combination will help people find the most appropriate documents to read.

From the end-user perspective, what is happening when I do a WAIS search?

WAIS is the system that sits next to the publisher making their information available. The users can use different interfaces to get to the information—gopher users work with certain interfaces, World Wide Web users will use something else. The America Online interface to WAIS is going to be available very soon. So there are lots of different interfaces to the same information.

If you're cruising the net using Web and hit a search box, often you're using a WAIS resource behind it. If you're using gopher and you hit a question mark icon, and up pops a little box, "What do you want to search?" you're probably using WAIS underneath.

The idea is that publishers have something to say to lots of different audiences and those audiences are going to use whatever devices they want for finding that information. Everybody's got a religious bent, whether they want their PC, their Macintosh, their Newton, their General Magic machine—whatever interface they want to use, we just want to be able to have the information get to those users.

Have there been conflict or problems by the ways people in different professions or cultures ask questions?

Some people are very careful about how they ask things and some people just blather. There are some people that say "IBM PC" or "Ethernet transceiver" and that's all that the server gets to try to figure out from the tens of thousands of documents that it may have which ones you want. Some people will use English language, as if they're talking to another person. We're trying to make a system that will work in those environments.

Another class of users are the real expert searchers, the ones that know how to use Boolean language and fielded search, they know this word, or I want this word next to this word and the author equals this; these are the librarians and professional searchers. Lawyers also know these types of things. We're trying to make a system that is useful by everyday people to just browse and have fun, and for other people that really know what they want to be able to screw down and get just those three documents.

Is WAIS available for different languages?

Yes, the European languages, and Fujitsu is making a Japanese version.

I saw an interesting thing that Fujitsu had done. I don't know if they're going to release it, but they integrated online machine translation so you can ask a question in English against a Japanese database and it translates the Japanese documents into English for you to see. It was mind-blowing. Of course it's not perfect translation. Even people aren't very good at translating English to Japanese or vice versa, but it did make it readable. The aspect of making it so that people in Japan can communicate more freely with people in English through these publishing mediums with electronic assistance is astounding.

There is an important step before full-text online translations, and that

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is just being able to search across servers in the different languages. For instance, posing an English question to a Spanish-language database.

You can do that now and the standards are catching up to make that done in a completely standard way. We still have problems of how do you represent all of these languages in computer-readable form? Kanji is a problem, not just that it doesn't fit into 8-bit ASCII. It takes 16 bits or more. But trying to find where words start and stop in Kanji is a challenge. There are many aspects to WAIS that aren't just of displaying document problems. WAIS really has to understand a little bit about the document to know where the words and phrases are and what's important about them so you don't get irrelevant material. That changes from culture to culture and language to language.

In addition to text, how does WAIS deal with multimedia documents?

You can search databases of text as well as images and video clips or whatever. WAIS uses tags—natural language tags which are descriptions of documents, descriptions of pictures, or maybe it's the sound track for the video. Define what video you want and then, when you double-click on it, it can be anything, a word processor document, pictures of Europe, rock music recordings.

And retrieving them?

It can be done over the networks transparently. There's a speed issue. Text is able to be done easily over modems. For still images, modems are getting to be a little slow, but the Internet connections, which tend to be 56K, are fine for this. We need faster speeds for doing video and audio.

There's no reason to think that this technology is not going to help make video archives or video artists able to publish their media where they are unable to now through the Blockbuster-type chains. It's changing the publishing equation by allowing individuals to publish on the networks as opposed to having to go through large-scale publishing enterprises.

WAIS, Inc. provides the back-end, or software for the publisher, while the front-end software is freeware?

Most of the WAIS software is not done by WAIS, Inc. It's been done by the freeware community, which is this phenomenally rich, interesting group of people that are spanning the globe working together to make an open information infrastructure.

Most of the user interfaces that are available now are available for free on the Internet. You can use file transfer from wais.com to get them. There's even free server software, but for those people that want to go into production, that want to have really good searching, they tend to want a commercial-grade tool. That's what we sell. That's how we support ourselves. But we're very much dependent on the freeware world to keep the freeware good and also, the most important thing is to get rich information resources out there in lots of specialties.

And how closely do you work with the freeware people?

Weekly basis, daily basis. We're a major distribution site for the freeware. We put out some of our enhancements as freeware. Basically, we need critical mass in terms of a publishing system so we're all talking the same protocol. The key piece is Z39.50, URLs, and a bunch of other acronyms out there. The idea is that it's open protocol, not a protocol that is "open" that's really owned by a company.

Do you foresee some of the front-end software being commercialized?

Absolutely. Apple has just announced that they are "gatewaying" from their AppleSearch product to the Internet WAIS servers. So you can, from your Macintosh environment, search the Internet using this product that's due out later this year.

What do you mean by "gatewaying" from AppleSearch to WAIS? Does that mean it is another type of WAIS front-end?

Apple doesn't like to think of it that way. I would put it the other way around—people in the AppleSearch environment can get to WAIS resources. So people in the America Online community can get to WAIS resources, like people in the gopher community can get to WAIS resources.

What is the relationship of AppleSearch to the WAIS engine?

AppleSearch will be able to search WAIS resources on the Internet. Apple is one of the original members of the WAIS project, which included Apple, Dow Jones, Peat Marwick, and Thinking Machines. An existing project at Apple was working on a similar problem for the local area networks that became AppleSearch. WAIS offered a method to opening it to the outside world.

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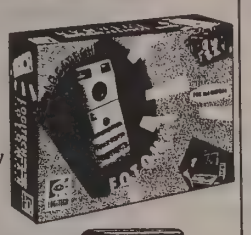

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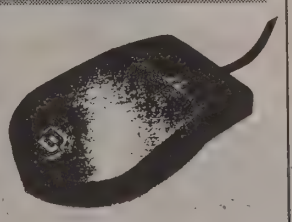

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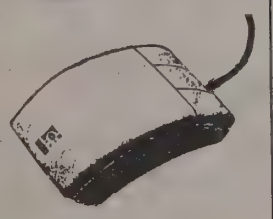

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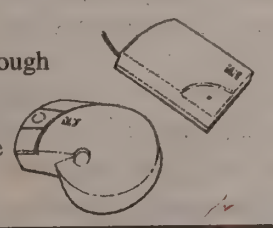

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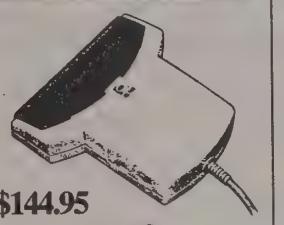

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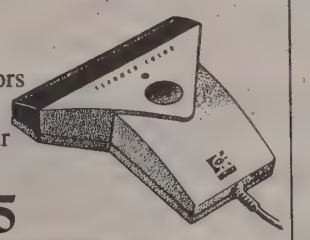

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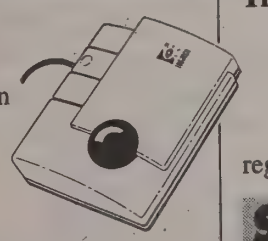

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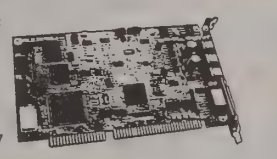

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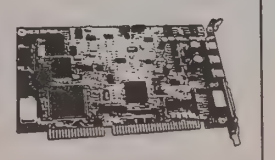

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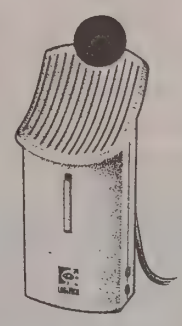

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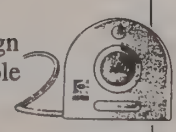

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WAIS In The Market

Who are the primary markets for WAIS?

We have two major ones and two minor ones. One is the government. The Environmental Protection Agency is making a set of services available on the net through WAIS. The Library of Congress is making some of its picture collections and things they had on CD-ROM available on the net. So the government has a traditional role of distributing information to very wide populations.

Another is publishers, traditional publishers that want to use this in a new way. We have two others, which are large corporations that want to publish internally and to the outside world. As we have more globally distributed companies, keeping people in touch about what is going on within the company is a real challenge.

Libraries are also trying to figure out their role in the new worlds of networks and electronic text.

Are there commercial WAIS servers?

They're just starting. There's a commercial WAIS server that's offering some government information. You'll see the roll-out of the *Wall Street Journal* in April. *Encyclopedia Britannica* is in test now and it will go live in the fall. So it's all just happening now. It's very exciting to see the shifts happening, there are a number of commercial enterprises setting up shop where they're selling information over the net.

Are there mechanisms for payment?

Network publishing can support any type. You can charge per document, per search, however you desire. The mechanism people are looking at most is subscription-based, you can use the *Wall Street Journal* and all the back issues, all you want for a month for similar pricing to what you'd pay for a paper copy.

That's the thought that's going into pricing in these environments. It's low-price so end-users, everyday people, can use these information sources and they can use them all they want.

Besides the projects by Dow Jones and Encyclopedia Britannica, are large corporations using WAIS on their enterprise networks?

Perot Systems and Lockheed are examples. Perot Systems put all the resumes of everybody in the company on its computer so you can find people. They have contract proposals, presentations, and have also downloaded some CD-ROMs, by paying the CD-ROM publisher and making it available to their company.

Is there competition to WAIS? Others like Mead Data, Lexis/Nexis? Is one of the major differences between those services and WAIS the issue of open protocols?

The difference between us and the Dialogs and Mead Datas, which are centralized publishing models, is that WAIS is decentralized. It's uncontrolled and uncontrollable. Anybody can go and use the software and make their words known. So it's more based for open networks and distributed computers. Lotus Notes has been targeted mostly for LAN-based environments within a company where WAIS was designed for cruising databases all over the world. You don't know exactly what you're looking for, so it's oriented a little bit differently, although all of these systems, we hope, will become compatible with using WAIS resources. So we would love Dialog's and Mead Data's data to be available on the Internet through the open protocols of WAIS, as well as Lotus Notes. We want those users to be able to get at WAIS resources. Are either of these happening? There've been talks about it but nothing concrete.

I don't think that there's really direct competition because the networks are too new. Gopher, World Wide Web, WAIS, we all gateway to each other. They're all based on open protocols. I'd say the way we'd lose is if we didn't do a system that's good enough so that there's room for a proprietary solution to come in. That's the danger. All the other companies, the search engine companies, the database companies, got very excited because they can get at more users, they can get at more information, that's a win-win situation.

We talked about the end-user. What is the provider or publisher doing with WAIS?

There's the traditional publishers who are using this as a mechanism to distribute their work in a new way. For examples of some of those involved, Dow Jones will be distributing the *Wall Street Journal* and same day *New York Times* on the Internet through the WAIS system. Another is Encyclopedia Britannica, who is bringing their whole encyclopedia to the Internet through WAIS and World Wide Web. This is where you get traditional publishers seeing WAIS as a mechanism to get to people all over the world by having their information in one place and selling subscription services.

We're also seeing lots of other people becoming publishers. And that's the new thing I see that is societally interesting, as new things happen because we have this new technology. So, for instance, Sun Microsystems is distributing all of its information, press releases, bug fixes, etc. over the nets using WAIS. Small groups, like the A Right To Keep And Bear Arms group, have also set up their servers. It's not my particular cause but I'm really glad that they're able to have a mechanism to make their point of view known. So we're getting lots of people publishing lots of different types of documents. We want musicians to be able to not only publish for free but also be compensated for their work where before they were not able to find the niche within the traditional publishing environment.

WAIS and WAIS, Inc. grew out of something you were working on at Thinking Machines. Unlike most other Internet tools, there seems to have been a commercial vision for this project from the get-go. What were you doing at the time that led to this project?

Thinking Machines is a parallel computing company. In the early '80s it suddenly had hundreds of times more computing power than people ever had before. The question was, What do you do with it? Well, you can simulate weather better. You could try to find oil under the ground. But we also thought that there was something we could do that would be usable by everyday people. Finding the right things to read was the one that we had in our minds from a project that we began back at MIT.

When the [Thinking Machines] computer came along, we tried out search-

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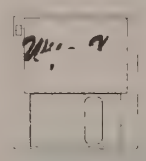

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ing through gigabytes. In 1985, we did a project searching through 15GB with a twenty thousand-term query and it only took three minutes. It took a supercomputer to do it, and this was one hundred times faster than anything else at the time. You could browse through colossal collections. Of course 15GB is not that much anymore; that's about what you work with on a workstation or high-end PC.

What Thinking Machines had was a view of the future, of what things would look like in ten or fifteen years. Now we're at that time and it doesn't require a supercomputer. In the mid-'80s, when Dow Jones bought one of these systems to search through 450 magazines and newspapers to find the articles you wanted required a supercomputer. Now it can be done on a Sun microcomputer or almost any kind of UNIX box.

Another way to look at where the project came from is, "yes, it came from a very commercial background." We think it's important that people be able to be compensated for their work, or you can't have an enduring environment. When the printing press came along there wasn't the concept of copyright, and it took 150 years to get the royalty systems together that we now have for books and newspaper publishing. At that time writers more or less donated their work, or got a fixed fee, a one-time fee for their work. If we can help the network environment establish a process so people can be compensated for their work, the whole field will expand much more quickly. We want high-quality information as well as free information out there. The technology is not innately worth anything. It's the content that you can get to people that's important.

What brought Thinking Machines, Dow Jones, Apple, and Peat Marwick together to develop WAIS?

Thinking Machines and Dow Jones built an innovative search system called DowQuest, and we thought it would radically change the world. Well, the world wasn't terribly different. Yes, they made money on it. It was an interesting product. But it didn't affect everyday people. The question was, Why? Was the pricing wrong? Were the networks not there? Did it need a graphic user interface? What were the pieces?

So I spearheaded a project to say "all right, let's figure it out. Let's go and get a group of companies to work together in relative secrecy to figure out what it takes" Apple Computer is world-renowned for great user interface design; Thinking Machines for search engines; Dow Jones for one-stop shopping for information for business people; and Peat Marwick represented a community that knew what their time was worth—they were a perfect community, non-techies. If we could make it usable by the partners at Peat Marwick, we'd have a system that would work. And we built a system in nine months, a crack team of people across the country. We found that, yes, Peat Marwick's people did like it, they would use day by day.

The problems were the networks. The network was just too hard to construct. This was back in 1989. The Internet was still a research network. It really wasn't mainstream at all. And that's when we looked around and said, "Well, the Internet is working. Let's use the Internet as our model."

Thinking Machines produced a freeware release. It was a little hard to argue for this with the management at Thinking Machines. We were saying, "We want to take this new idea and distribute it in the public domain, no copyrights, no patents, no control. Anybody can take it, copy it, merge it into their own programs."

"Why would you possibly want to do that?" was a question I had to answer. And the answer was that we wanted to catalyze a market for information servers. We needed a critical mass and the only way to do it was to seed the

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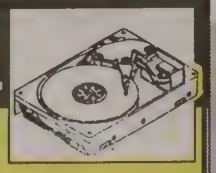

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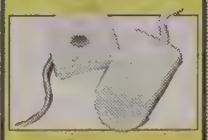

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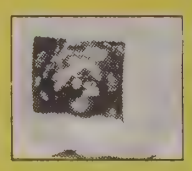

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market with a good enough system to get the ball rolling. Thinking Machines is a long-range company and they said, "Great, let's do it." They wanted, after the market was built up, to sell supercomputers to this market. They've sold a couple into it already, but as the market grows, there will be colossal text collections that will need their computers. So it was not money badly spent from Thinking Machines' point of view. But it did set a precedent that these systems are going to be open.

Does WAIS offer a new business model for the networks? What is the relationship of WAIS, Inc. to the Internet culture where, traditionally, information was distributed freely? Also, what would stop anyone else from taking a freeware version, enhancing it, and providing the support services you offer?

That's several questions. Is this a new business model for how to disseminate information? Absolutely.

I think there will be an enduring need for free components—they will always be available, but may not have all the features. There are people using this system in schools that would just not be able to buy much software. So, it's important to have a free version out there.

It's also important that when people need more features or capability that there's an avenue for them to get what they need, which is often not the case on the Internet. You can't buy quality versions of some of the things on the Internet even if you wanted to, yet. We think that there is room, based on open systems, to have commercial and free versions at the same time.

You asked the question, "Can someone come in and compete with us?" Absolutely. We're playing the open systems game. When we started the project with Apple, Dow Jones, Thinking Machines, we said it was going to be based on open protocols. In fact, at that time the protocols weren't very good; we needed to get them better. We've spent about half of our engineering resources

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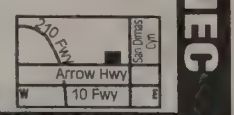

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making the open protocols good enough for our competitors to use. Why? Because it needs to be an open system to expand, to be an interesting environment.

As a business model, providing commercial support for freeware, how similar is WAIS, Inc. to Cygnus, which supports GNU software?

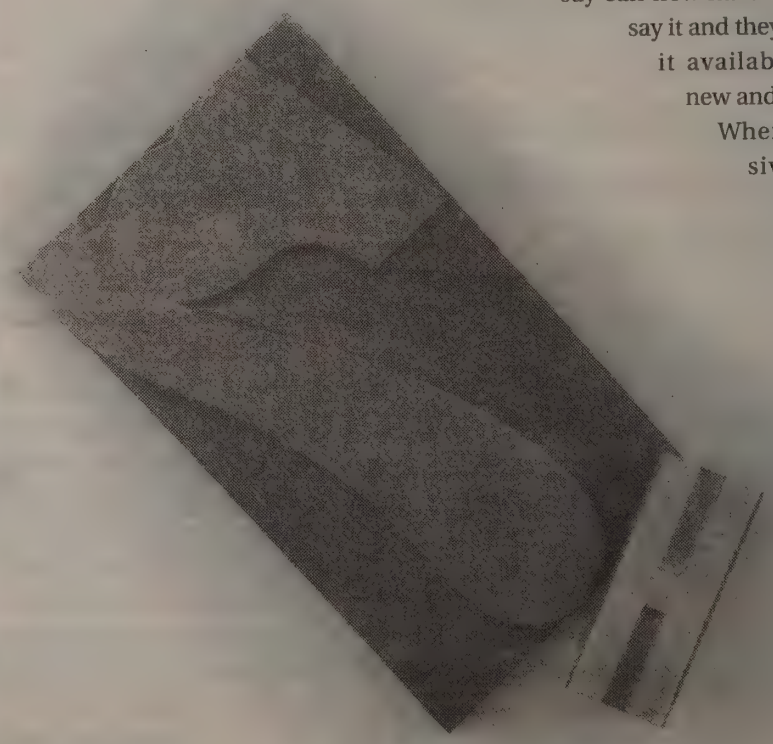
We're quite different from the business model of Cygnus. Our server has been rewritten from scratch. I helped write some of the freeware version of the server software. But when we formed the company, we started over and rewrote the system from scratch based on the protocol Z39.50. It's a completely different implementation that's much higher quality, and it's portable and has been extended in many different environments. Unlike Cygnus, which is all the same code base and they provide support, this is a different product. There are other companies implementing WAIS standards and those are completely different implementations. The important thing is that we all have the same protocol. So where most people talk the same code base in the PC world, in the network environment it's not the code that's important, it's the protocols.

So that everything, whether it's a WAIS server from you or something developed from freeware, they all communicate.

They all communicate.

You have written about network publishing, describing it not as something replacing books or even saving trees, but as a new media form. What is your vision of network publishing?

For me the important aspect of network publishing is not that you can now peruse the library in Moscow from your desktop machine. It's turning the equation around. It's that anybody with something to say can now have a forum to say it and they can make it available in this new and open way. Where successive technologies have



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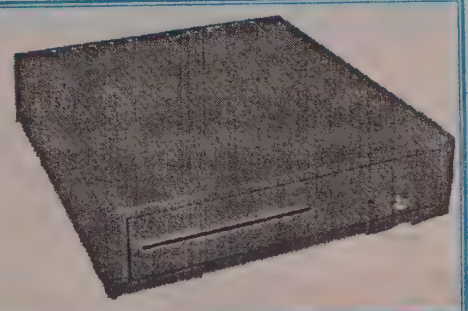

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LIGHTNING

On Windows-shattering competition, Comtrade's EISA Professional System stood head & shoulders above 191 others to win the coveted PC Magazine's Editors Choice award for best Windows Workstation, December 7, 1993. This is the sixth time in recent months that lightning has struck at the same place - Comtrade. This Comtrade EISA system also won Computer Shopper Top Ten Best Buy, PC Sources Best Buy, PC World Best Buy and Computer Buyer's Guide & Handbook Best Buy. Call Comtrade and find out how you can have the lightning speed and quality of a Comtrade system.

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continued from page 86

opened up more and more ways to make their words known, network publishing is a huge jump. You can now publish your words to people in forty-five countries with only a computer and a telephone. That's all it takes.

There are very few generations that get to see the development of a new technology for how people communicate. That generation gets to see all sorts of wild things happen: industries come and go, what it means to be in a family and how companies work changes. All of those things change dramatically based on a new communication technology. I'd suggest network publishing is such a change. It means that you don't have to go through the established hierarchies that have built themselves up around older technologies of information distribution. People can take their photographs of Asia and make it available on the networks and find other people that have similar interests. You can take your MIDI files of music recordings and make those available, and find other people that are interested in your kind of music; and, as we're seeing now, people are starting to do it for pay, not just for free. It's more than just electronic mail or bulletin boards. It's not just conversational. People are putting together real works that are composed and created to work over time. They're not just a snapshot of email.

Is electronic network publishing changing our notion of what a book or document is? It opens the possibilities for customized books, or books that change over time, or books that can be easily read in a nonlinear fashion.

Yes. We're only starting to see some of the new types of literature that will come out of this new medium. As [Marshall] McLuhan wrote, the new medium contains the old medium. So the first thing you do in a new medium is just make a copy of the old medium. Later it will start to evolve on its own. It's hard to know where it's all going, but one way to try to think about it is to look at the different types of books we have. Try to think what would make a really great electronic encyclopedia? Well, it wouldn't just link to the documents within itself, it would also point out to the real world and point to current newspaper articles. Or, look at an atlas. You wouldn't want a static picture of each map. You'd want to be able to zoom in and out, move around, see it over history, and turn different knobs to be able to interact with maps in a new and different way. We'll see every book type and every information type evolve as the market grows up on the nets. The key piece is to make sure there's a market and not just the technology.

One vision for the future is that publishing houses will become a company with a server, providing an outlet for the writer or photographer or musician who does not have their own server.

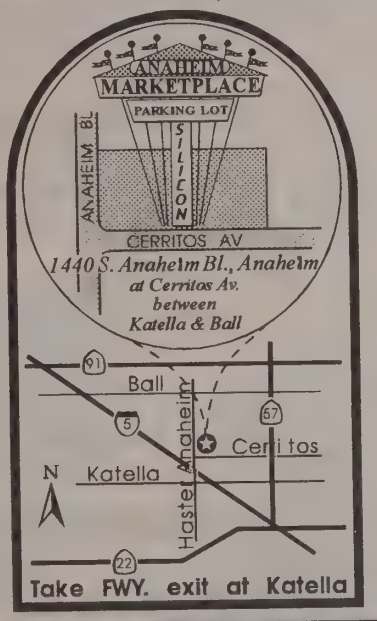
Yes. Right now it takes quite a bit of technical sophistication to make yourself an Internet node and run these services, but it's becoming easier and easier. There are already service bureaus which make somebody else's catalog available on the Internet through WAIS or World Wide Web.

It will get to the point where small companies or even an individuals' machine will be able to be those nodes. It's becoming easier and easier to run these small-scale printing presses for Internet distribution.

What are some of the other issues network publishing will force us to reexamine?

COMPUTER SWAP MEET

SUNDAY, APRIL 17, 1994 8 A.M.–2 P.M.



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The world is a dynamically changing environment. The archivists have got some real work to do. I am working with a group of people founding the Library of Alexandria Foundation, which is trying to archive some of the works that are created on the net that were never meant to be printed.

Every librarian has two hats. There's the access hat and the archiving hat. Right now on the Internet we're very heavily biased on the access, but there's cultural changes and sociological changes going on that are not even being documented, they're not being saved, and it's time to start addressing these issues.

Is the question of authenticity of a document part of archiving—being able to make sure the copy you have is made from an unaltered original?

Authenticity on the networks, security, and identity on the networks are all very real problems, and haven't been resolved very well. There are people going onto and making money on these systems that are actually very easy to spoof. So, it's possible to steal on the networks as real commercial enterprises join in. And those access methods really need to be moved towards actually figuring out who is a person and is their money good? Is their Visa card number good or is it just stolen? Those sorts of aspects are still to come.

And digital signatures on documents?

Digital signatures is another technology for authenticating a document. It's becoming less of a problem. If you want to get a copy you go back to the original source, so you don't necessarily have to have many copies of a particular document floating around on the net. You can just reference the original copy on someone's hard drive and when you want it, click on it, and you retrieve the original document one more time from the original location.

In that way it's different from the printing environment where there are copies floating around. They can be altered. In the network publishing model, the publishers control the distribution of their work and they certify the authenticity of the work that they have. That's what a publisher does.

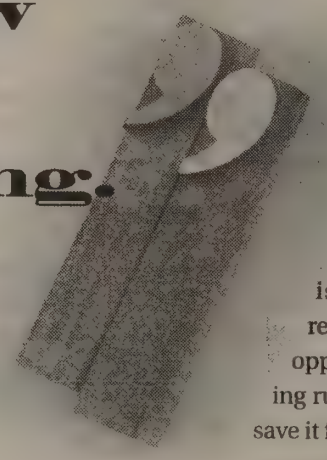
Archiving for the nets reminds me of the evolution of printed material and how systems needed to be developed to manage the growing volumes of information, documents, and books that were being collected. How will we handle all the new information available electronically?

Let me try to answer this by saying that when people are complaining of information overload it means the tools aren't good enough to find only those things that they want to read. And the tools aren't good enough, yet.

We think that making the tools better for searching will include using "editors" to help select works and to let you know that these are the hot articles. You might subscribe to several different editors to help select the different articles that you want to read. Editors will be the next wave of navigation tools on wide-area networks.

When the printing press came along there wasn't the concept of copyright and it took 150 years to get the royalty systems together that we now have for books and newspaper publishing.

The other question is archiving. This is just starting and there is nothing good to say, yet. In terms of actual experience, there are only horror stories of archiving in the electronic publishing world. But what will help on the archiving side is that it is really cheap to archive things. With an $8 tape you can store 5GB.



Is copyright another issue with archiving?

I would say copyright is more an issue of access, restricting access, as opposed to the archiving rule which is how to save it for the future.

We are beginning to see the early battles over electronic copyright, what rights are being bought and sold, and how authors or creators should be compensated.

Yes. Exactly how the compensation structure will work in the electronic world has not been figured out and it will take time. The key piece is that somebody will start making some money somewhere. That's what we are trying to figure out now and we're in the very beginning throes.

We're excited that successful models of putting across content that people will want to pay for on the net, open networks, is starting to happen. All the rest can figure itself out afterwards. It's an important question, but if you don't answer the first one, we don't even have a game to play. ■

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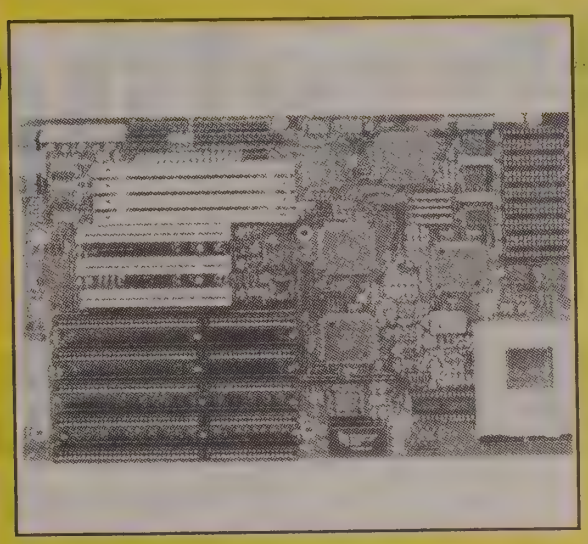

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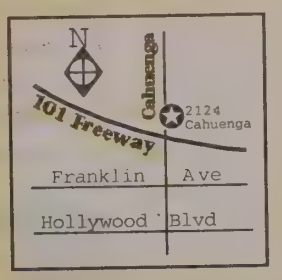

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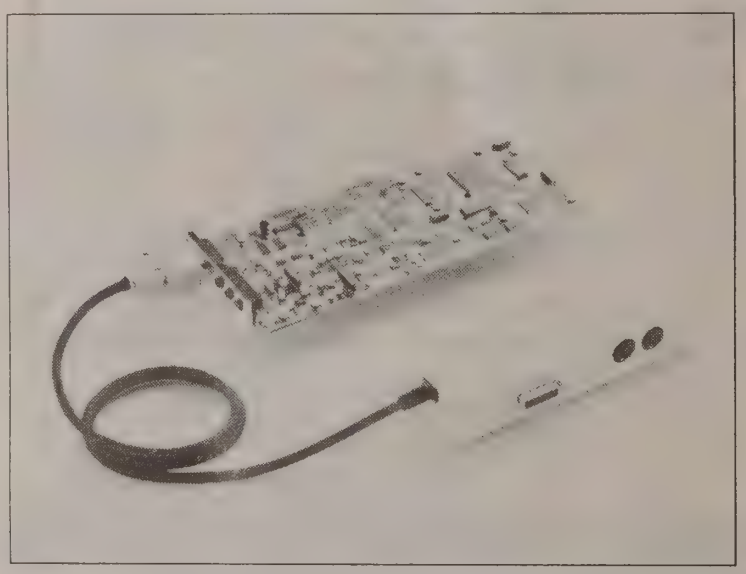
Multimedia Hardware

ROLAND AUDIO PRODUCTION CARD

The Roland Audio Production card, RAP-10, enables musicians, multimedia developers, producers, and hobbyists to record their own tracks onto a PC hard drive, edit, and sync everything with their own sequences or commercially available Standard MIDI files. The RAP-10 is a 16-bit sound card compatible with Windows 3.1 and MPC-Level 2, offering CD-quality recording plus a professional-level music synthesizer using wave table synthesis. The synthesizer is a state-of-the art, 28-voice, Roland Sound Canvas chip which generates realistic sounds of musical instruments as well as rich synth textures. It comes packaged with Roland Audio Tools, a comprehensive audio editing software package for Windows. ($599) Roland Corp. US, 7200 Dominion Circle, Los Angeles, CA 90040-3647. (213)685-5141.



DIGIDESIGN SAMPLECELL II FOR WINDOWS

SampleCell II is a 16-bit, 32-voice sample playback card for the Windows PC platform. It provides an easy-to-use, powerful, and cost-effective sample player for music and audio postproduction. A basic SampleCell II system features dynamic digital filtering and eight polyphonic analog outputs. Also included are two CD-ROM sound library discs with over 650MB of ready-to-load instrument samples and sound effects. Each card supports up to 32MB of RAM. ($1495, RAM not included) Digidesign, Inc., 1360 Willow Rd., Menlo Park, CA 94025. (415)688-0600.

Continued on page 101

UPDATES

✣ **Borland International** announced **Borland Office 2.0** for Windows. The package includes WordPerfect 6.0 for Windows, Quattro Pro 5.0 for Windows Workgroup Edition, and Paradox 4.5 for Windows Workgroup Edition. Current users of WordPerfect, Quattro Pro, or Paradox for DOS or Windows can upgrade for $249. Borland International, Inc., 1 Borland Way, Scotts Valley, CA 95066-001. 1-800-331-0877.

✣ **Island Graphics** shipped **IslandTrapper 1.1**. All registered users will receive the upgrade for free. Island Graphics Corp., 4000 Civic Center Dr., San Rafael, CA 94903-4178. (415)491-1000.

✣ **Hewlett-Packard** reduced the price of its **HP Optiva 95R** toner cartridge to $79. Hewlett-Packard Co., PO Box 58059, MS511L-SJ, Santa Clara, CA 95051-8059. 1-800-527-3753.

✣ **Jensen-Jones** introduced **Commence 2.1**. Registered users of Commence 2.0 who purchased their copies on January 1, 1994, or after may ugrade for free. Other registered users of Commence 2.0 may upgrade for 29.95. Registered users of Commerce 1.0 may upgrade for $69.95. Jensen-Jones Inc., Parkway 109 Office Center, 328 Newman Springs Rd., Red Bank, NJ 07701. (908)530-4666.

✣ **MAGEE** announced **Automenu 5.0 Net**. Registered users may purchase the upgrade for $99 per server. MAGEE, 2909 Langford Rd., Ste. A600, Norcross, GA 30071-1506. 1-800-662-4330.

✣ **ON Technology** introduced **Notework 3.0**, which has a completely redesigned Windows interface. Upgrades are free to purchasers of Notework 2.5 and $29.95 for purchasers of Notework 1.0. ON Technology Corp., One Cambridge Center, Cambridge, MA 02142. (617)374-1400.

✣ **PrairieSoft** released **DiskTop 4.5**. PrairieSoft, Inc., 1650 Fuller Rd., West Des Moines, IA 50265. (515)225-0134.

✣ **Tippecanoe Systems** announced **Bars & Stripes for Word 6.0**, which now supports Word for Windows 6.0. Tippecanoe Systems, Inc., 5674 Stoneridge Dr., Ste. 119, Pleasanton, CA 94588. (510)416-8510.

✣ **Traveling Software** announced a **CommWorks and Gateway 2000 modems bundle**. Traveling Software, 18702 N. Creek Pkwy., Bothell, WA 98011. (206)483-8088.

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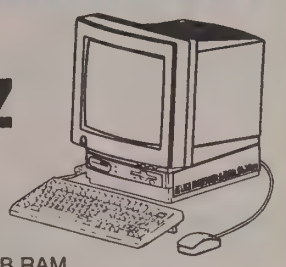

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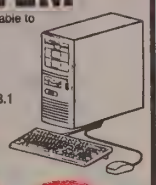

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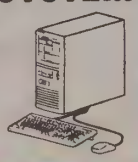

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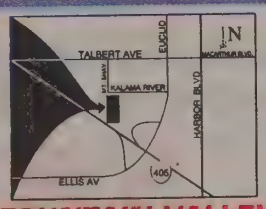

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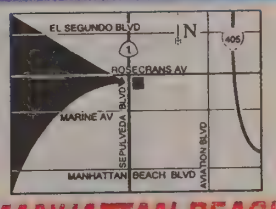

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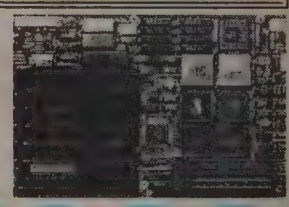

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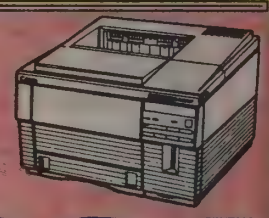

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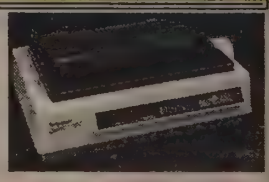

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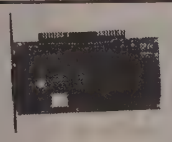

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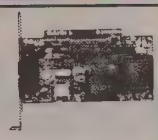

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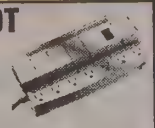

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The SnapEase 42" Computer Desk is ideal for use in the home, office or dorm. No tools are needed for assembly, just snap it together. Includes keyboard drawer and mouse tray. 42" w x 24.5" d x 30" h
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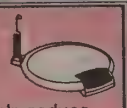

- Ergonomic design to help reduce wrist fatigue
- Leather cushion
- Metal support for mouse cable
- Tyron™ work surface
- Adjusts for left or right-handed users
- Black finish only

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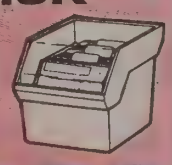

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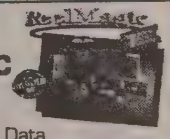

CD-ROM DRIVE
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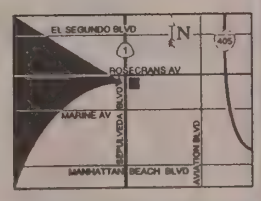

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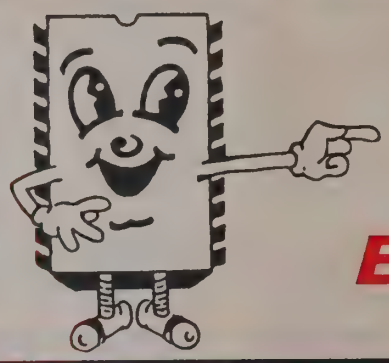

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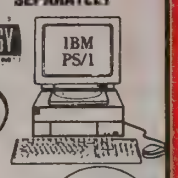
486SX-25MHz 170MB MULTIMEDIA SYSTEM



Intel 486SX-25MHz CPU • 170MB Hard Drive
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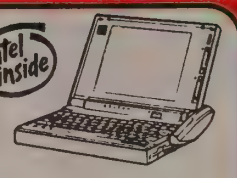

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25MHz 80486SX CPU • 4MB RAM • 3.5" 1.44MB Floppy Drive • 128MB Hard Drive
Serial/Parallel • VGA Output • Color Screen • Built-in Fax/Modem • 5.7lbs.
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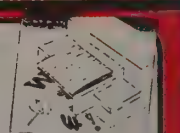

DeskJet 520 Inkjet Printer

Clear, sharp, professional-quality black output with 600 x 300 dpi black printing, HP's Resolution Enhancement technology for smooth, crisp characters, fast text printing at up to 3 ppm, 256 levels of grayscale, energy efficient, and has a three year limited warranty.
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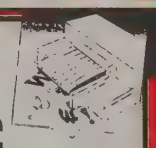

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- 45 built-in scalable typefaces
- 2MB standard memory, expandable to 26MB

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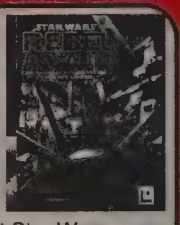
Star Wars REBEL ASSAULT



Rebel Assault is the first Star Wars game to include actual footage from the Star Wars movies. It uses intensive 3D rendered art, and it comes with 15 action packed levels.

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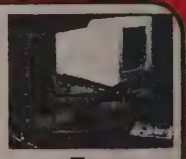

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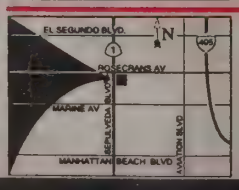

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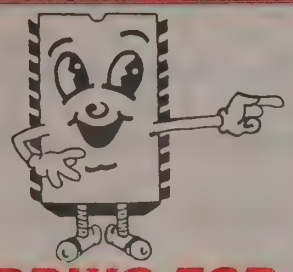

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Parallel Interface • 1 Font Card slot
One Year Warranty
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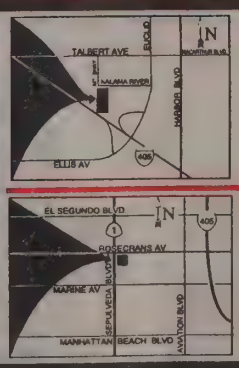

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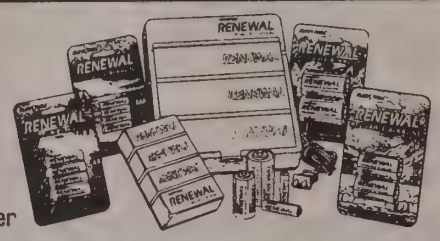

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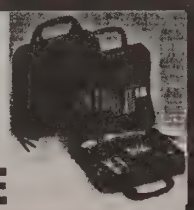

Black cordura with two exterior meter pockets and one document pocket. Interior has 29 sewn tool pockets and one meter pouch.
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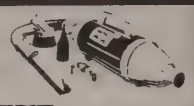

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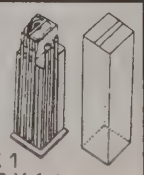

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CA216
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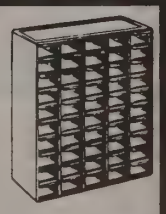

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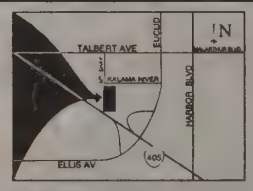

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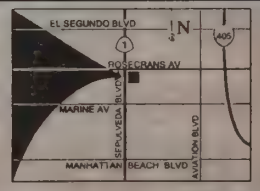

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Below left: WideFax 36 from The WideCom Group, Inc.; Bottom left: The Tektronix Phaser 220 color printer.

Continued from page 94

Printers & Scanners

WIDEFAX 36

The WIDEfax 36 is a combination 36" scanner, plotter, copier, and facsimile designed to address large-document and communication needs. The high-speed, large scanner can scan an E-sized (36" x 48") document and save it as a compressed file in thirty-two seconds. This allows replacement of large paper files and modifications of old drawings without having to redraw them completely. The scanner also functions as a high-speed direct imaging plotter and is the world's only 36" fax machine. Each module can be purchsed separately, then upgraded to add the other features. ($6995) The WideCom Group, Inc., 267 Matheson Blvd., E., Mississauga, Ontario, Canada L4Z 1X8, (905)712-0506; or Array Cad Systems, Inc., 1352 Pico St., Corona, CA 91719 (909)278-4723.

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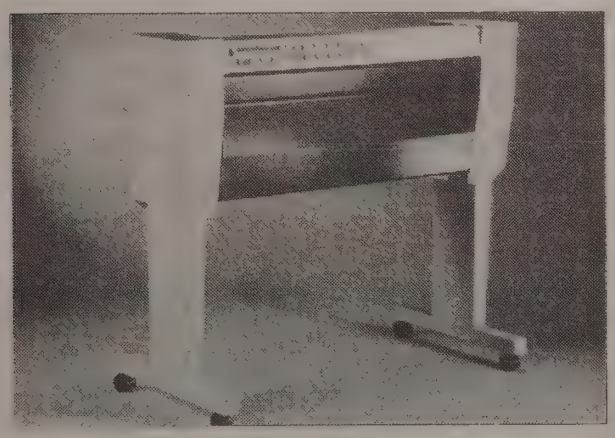
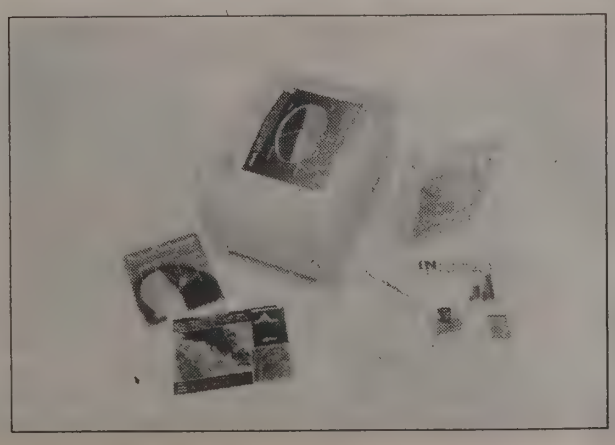
The new Phaser 220i and 220e thermal transfer color printers provide 600 x 300dpi with Tektronix's proprietary TekColor SuperCell 600 technology. With SuperCell 600, text and graphics are sharp and clear, approaching the quality of continuous-tone dry sublimation printers, but at much lower cost and higher speed. To meet the needs of workgroups that share printers, the high-resolution Phaser 220 printers output at a fast two pages per minute, feature flexible network connectivity options, and include ColorCoat technology to enable printing on most papers. Both printers feature standard parallel, serial, and AppleTalk ports. The Phaser 220i adds Novell NetWare and Apple EtherTalk support with an Ethernet option. TCP/IP is also available. (Phaser 220e, $3995; Phaser 220i, $5995) Tektronix, Inc., 26600 S.W. Parkway, PO Box 1000, Wilsonville, OR 97070-1000. 1-800-835-6100.





REVIEWS

Game Reviews

MIG29

List Price: $57.99
Published By: Spectrum Holobyte
For: PC (12MHz, 286, 1MB RAM, DOS 5.0, VGA, optional mouse/joystick, Adlib/Roland/SoundBlaster)
Reviewed By: Fred Haslam

Mig29 is terribly complex, but then again so is the actual aircraft. Spectrum Holobyte has striven to the utmost for realism and I believe they have succeeded. Not only do you have control of a dozen weapon systems, three detection systems, two defense systems, radio, throttle, afterburner, targetting, and tracking; but you also get to remove the wheel blocks.

From my reading on military aircraft, the primary characteristic of the Mig29 is its speed. And it is indeed fast. It takes many miles to do a gentle bank. I frequently overshot ground targets or did a nose-plow while lining up a shot. As an experiment I reached 70,000 feet flying straight up.

The campaign game looks very promising and is touted as the highlight of Mig29. You are the base commander in charge of thirty pilots and eighteen aircraft. You receive information and mission instructions, then respond by assigning craft and pilots to missions. Your success and failure influence the overall ground campaign, displayed on a regional map. I really wanted to give the campaign a try, but had to give up due to my poor piloting. On the first mission I shot down two friendly craft and intersected a small hill.

There are two components to the Mig29 Interface: airplane and game controls. The airplane controls are complex, but easily learned after you get into Red Flag—the air combat school. The game controls and 500-page manual are best described as Byzantine. I had to search through two chapters front to back before finding proper takeoff instructions in the last paragraphs of chapter five. You can skip that mess and just play "Instant Action," but you will miss most of the game. The graphics are average for a flight simulator where drawing speed is emphasized. The sound was great at indicating near-misses, engine malfunctions, radio chatter, et al.

I recommend Mig29 to flight simulator fanatics and to people who want to become FSFs. The more I played, the better I became. The same will be true for you. (Spectrum Holobyte, Inc., 2490 Mariner Square Loop, Alameda, CA 94501. 510/522-1164)

COMPANIONS OF XANTH

Designed By: Michael Lindner
Published By: Legend Entertainment Co.
For: IBM PC compatible (hard drive, 640K RAM, Microsoft mouse, VGA/VESA compatible SVGA, Adlib/SoundBlaster)
List Price: $46.99
Reviewed By: Fred Haslam

Xanth fans rejoice! The latest Xanth novel *Demons Don't Dream* has arrived and is the template for the first Xanth computerized adventure: Companions of Xanth. As a matter of fact, the game contains a copy of the book. But don't worry; while the book presents the same story and the same problems, all the solutions are different. You do not need the book to finish the game. All you need is an IBM PC compatible and a mind for puns.

Puns you say? Those familiar with the fantasy realm of Xanth (created by PierXANTHony) know that puns come to life in this medieval world. Cherry bombs grow on cherry trees, shoes grow on shoe trees, and butter can be found in buttercups. Nightmares ride through the night skies to deliver bad dreams, while Bum Steers moo for cigarettes. If you like puns, you should love Xanth.

I only read enough of the novel to confirm that the solutions were different, but I played the game to the end. The writers are to be commended for dialog. The main character is a smartass who gets lines like: "I'll just

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scurry off and do my little hero thing," "Hey, I've become very attached to that bucket," and "Yippee! I'm a badass censor douser and I deserve a reward!" It's hard to describe how funny some of these lines are without telling you the whole story.

The game interface is nicely intuitive. Sometimes on a slow machine there is a time lag before a mouse click is recognized. Just hold down the mouse button till the game responds. The artwork is very nice, with the occasional animation sequence. Music and sound effects are good, but convey no vital information.

As an adventure game, Companions suffers from a common adventure flaw. The game is too linear. You can't get to problem "B" until you've solved problem "A." Given that the story is trying to parallel a novel, this is nearly forgivable. Past that, I would categorize the game as average for game play and above average for story and dialog.

Postscript to Xanth fans: some problems use classic Xanthian solutions—you'll love it! (Legend Entertainment Co., PO Box 10810, 14200 Park Meadow Dr., Chantilly, VA 22021. 703/222-8500)

MERCHANT PRINCE

Designed By: Several Dudes Holistic Gaming
Published By: Quantum Quality Productions
For: IBM PC compatible (1MB RAM, DOS 3.3, hard drive, VGA, mouse, Adlib/SoundBlaster, modem play)
List Price: $49.99
Reviewed By: Fred Haslam

Exploration, trade, conflict. These are the primary elements of Pre-Renaissance Italy. Sail around the horn of Africa, purchase spices in far-off Cathay, and build roads from Cairo to Timbuktu. Hire guards and mercenaries to fight off pirates and brigands. Then send your money back to Venice to invest in your political career. Buy Cardinals, bribe Senators, hire Assassins—it all leads to one goal: political domination.

The exploration in Merchant Prince is great fun. You inherit an "accurate" map of the world from your deceased uncle. The world is laid out in parchment colors with medieval artwork for cities, mountains, and sea serpents. When you move your ships and caravans, the parchment map is replaced with 16-color graphics showing you the true coastlines and cities. As you move farther from Venice, this map grows increasingly less accurate—until you are exploring the coast of India where a desert is indicated.

The interface for Merchant Prince is mostly intuitive. I was able to play immediately without reference to the manual. Unfortunately, a lot of the advanced activities require you to study the manual closely. The artwork, except for the opening screen, is mediocre and 16-color. Sound and music are practically nonexistent.

Merchant Prince is fun, but lacks a finale. At the start of the game you commit to a certain number of turns. You can accomplish all goals in the game—become Mayor, Pope, explore the entire world—but play continues until those turns run out. Having to wait until turn one hundred to get a percentile rating is an anticlimactic conclusion to what is overall a decent game. (Quantum Quality Productions, 495 Hwy. 202, Flemington, NJ 08822. 908/788-2799)

Continued on page 108

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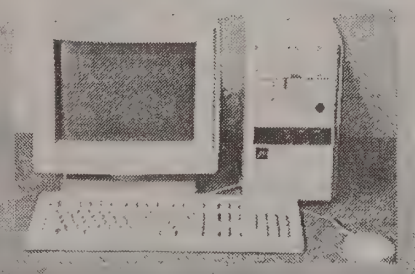

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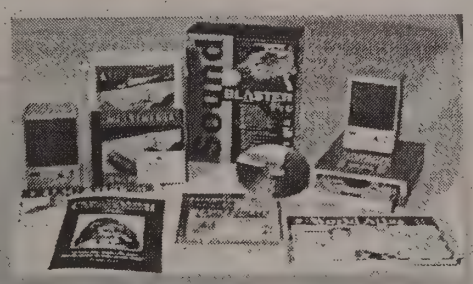

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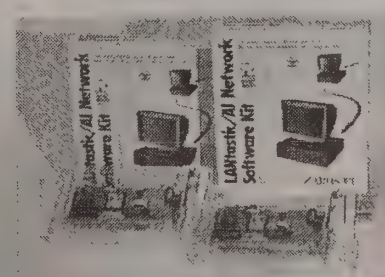

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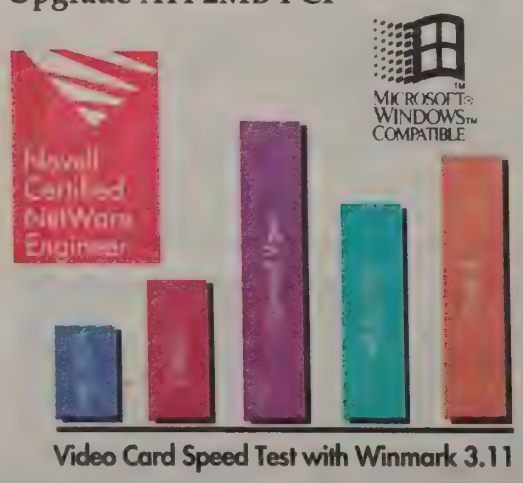

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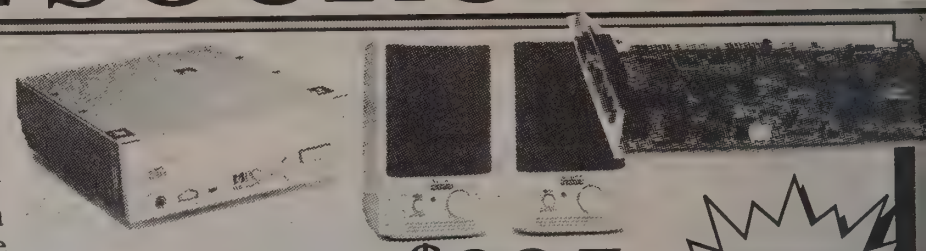

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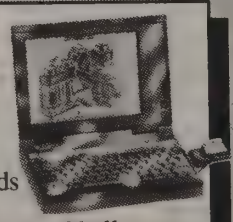

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Continued from page 102

Book Reviews

DOS 6 INSIDER

Written By: Ron Pronk and Keith Weiskampf
Published By: Wiley Publishers
List Price: $26.95
Reviewed By: Lenny Bailes

This is a book for graduates of the *DOS for Dummies/Voo-Doo* variety of self-help. It is written for DOS users who would like a practical exposition of what they can really customize and tweak in Microsoft's DOS 6. The book is cogently organized, with task-oriented section headings that cover utility tips, user-tutorials, and solutions to common system problems. *Insider* serves as a primer for DOS memory management, and hardware and software troubleshooting. A lengthy section is devoted to solving problems that arise when using the DoubleSpace disk compression utility. The book was published before the improved, DOS 6.2 DoubleSpace appeared, but notwithstanding this, the problem-solving procedures are still useful and applicable. There is a wealth of undocumented information on file recovery and system troubleshooting that the average user would glean only from calls to the Microsoft technical support line.

The enhanced batch file commands and system utilities of DOS 6 are introduced and explained along with a series of productivity tips. The book offers a technically sophisticated, but readable set of general tutorials on the Microsoft backup and antivirus utilities, DOSShell, and MemMaker. The detailed information that *Insider* provides on memory management is not typically found in books of this type.

The two coauthors of this book have provided a valuable reference tool for MIS types who understand DOS basics and need to maintain user-workstations on a day-in, day-out basis. The details you want to know about putting DOS through its paces are explained in greater depth and clarity than you'll find in Microsoft's own reference manual. A revised edition covering the changes implemented in DOS 6.2 would make this book a "must-have." (Wiley Publishers, 605 Third Ave., New York, NY 10158)

DOUBLESPACE—AN ILLUSTRATED TUTORIAL

Written By: Dan Gookin
Published By: Windcrest/McGraw-Hill
List Price: $15.95
Reviewed By: Lenny Bailes

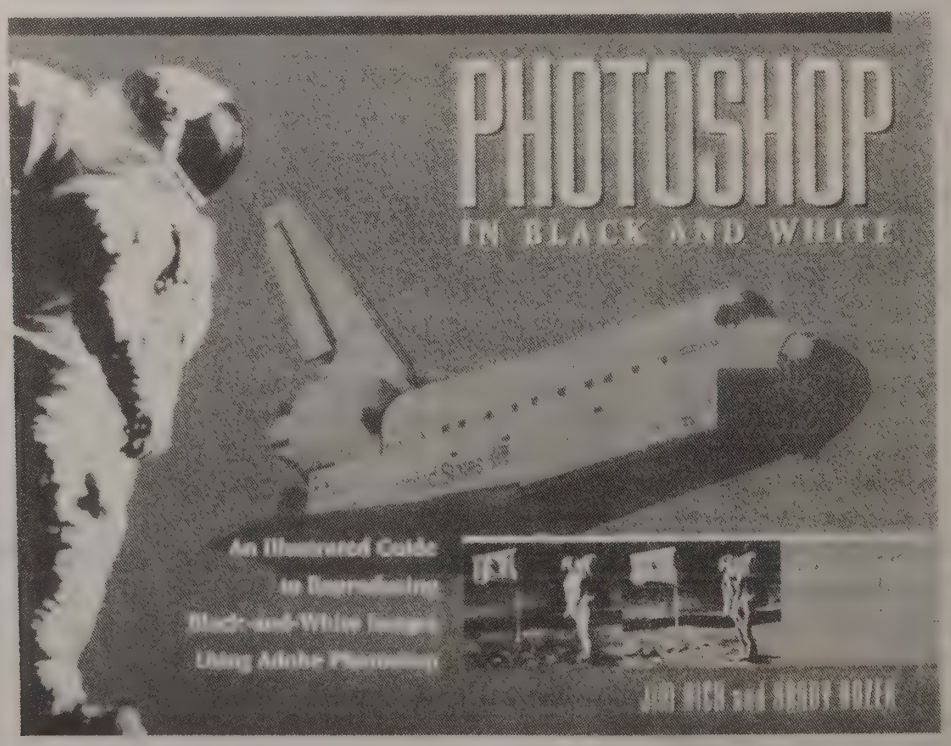
This slim volume by the author of *DOS for Dummies* recapitulates the basic Microsoft documentation on DoubleSpace in plain language for the novice user. No great secrets are revealed here, but if you're a right-brained person who has difficulty following the Microsoft mindset, you'll appreciate the simple analogies and pictures presented in this volume.

The two or three features that Microsoft added to the DOS 6.2 version of DoubleSpace will be transparent to most people who've struggled with the original version. It's the undecided novice with "disk compression anxieties" who will benefit by reading this tutorial. The book offers an easy-to-read overview of disk compression: theory and practice. Gookin steps you through the standard procedure involved in a DoubleSpace installation, explaining how most of the menu options affect what DoubleSpace does to your hard disk.

Seasoned DOS users will not find the depth and breadth of information here that is offered in *DOS 6 Insider*. The common-sense tips that Gookin passes to the reader might also be gleaned by studying the Microsoft documentation. The book does not explain or comment specifically on the programming changes that were made in DoubleSpace, v6.2. There's no mention of DoubleGuard, and no discussion of the DoubleSpace .ini parameters. Yet the book is well written, with amusing analogies that may painlessly guide the DOS novice through installation of this new Microsoft feature.

PHOTOSHOP IN BLACK AND WHITE

Published By: Peachpit Press
List Price: $18.00
Reviewed By: Matthew Leeds



While much of the focus on usage of Photoshop has centered around color images, it is also an excellent tool for working with black-and-white images. *Photoshop in Black and White* explains in exquisite detail how to adjust the tones in B&W images for reproduction and get consistent quality results.

The book explains how the halftone reproduction process works, how to calibrate your system for working with grayscale images, which tools in Photoshop you'll need to use, how scanners and output devices work with Photoshop, and is packed with tons of specific problem-solving details.

The amount of information delivered by this slim 48-page book is intimidating. The layout does little to diffuse this as it's cluttered, designed with tiny type, and introduces technical terms in rapid-fire progression (the included glossary is invaluable).

On the other hand, you can quickly learn the exact methodology required to fine-tune images and get great results. Step-by-step instructions are given for each process, and each process is laid out in a linear progression from calibration, scanning, adjustment, and output. It's one of the best speed-learning courses for the technology of print reproduction I've seen in quite some time. (Peachpit Press, 2414 Sixth St., Berkeley, CA 94710)

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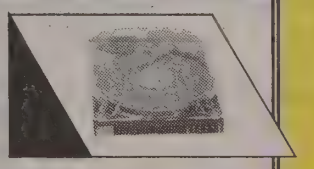

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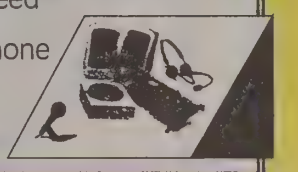

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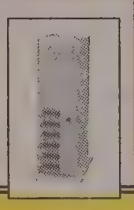

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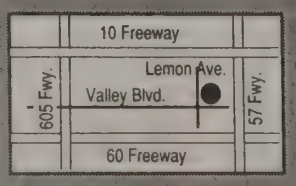

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PRODUCT SPOTLIGHT

GLOBAL NETWORKS

Edited By: Linda M. Harasim
Published By: The MIT Press
List Price: $29.95
Reviewed By: Anna Couey

There is a running joke on the nets about the need for a guide to help keep track of all the Internet guidebooks. Global Networks: Computers and International Communication, edited by Linda Harasim, takes the unusual tactic of focusing on the social and cultural issues of international computer networks, without the hype that is so typical in theoretical discussions of cyberspace. Global Networks is not another a "how-to" guidebook to the Internet. It is a guide to how computer networks have impacted human communications, and what that means on a global scale.

The book contains articles written by authors with network experience in Africa, North America, South America, Asia, Australia, and Europe. Some of the authors have run and developed networks in industrialized and underdeveloped countries, some work on policy issues, some have studied the impact of networks when used for educational, workplace or social purposes, some work on technological development. Their articles are grouped into four categories: overview, issues, applications, and visions for the future.

This brief overview by no means documents all chapters in the book, or even any single chapter in depth, but should give you a pretty good idea of the scope of Global Networks: John Quarterman provides an overview of computer network development and some of their characteristics—decentralization, resource-sharing, group communication, communities. Howard Rheingold describes experiences of virtual community on the WELL and on other systems. Lee Sproull and Sara Kiesler discuss the impact of computer networks in the workplace—including how networks reduce hierarchies, and increase the sharing of information or of ideas on sensitive subjects. Hiroshi Ishii describes cross-cultural difficulties in the development of groupware that depends on general models of human communication. Michael Kirby and Catherine Murray document the Organization for Economic Cooperation and Development's development of international standards for privacy and information security in computer networks, and its success in guiding the formation of "harmonious" informatics laws in countries with diverse legal traditions. Beryl Bellman, Alex Tindimubona and Armando Arias, Jr. discuss developing networks in Africa and Latin America, and issues of access to technology, governmental policies, and concerns of cultural imperialism that impact how they are developed and used. Jeffrey Shapard describes computer networking in Japan, the problem with English-centric standards for information exchange, and the efforts to develop standards that handle information exchange in all languages. Howard Frederick discusses the importance of non-governmental organizations' use of computer networks to the rise of "global civil society" and describes the Association for Progressive Communications (APC) Networks that link many of them together. Mitch Kapor and Daniel Weitzner articulate the need for an International Public Network, and offer some concrete steps towards achieving it. Shumpei Kumon and Izumi Aizu look at computer networks in the context of world societal developments—militarization, industrialization, and informatization—and posit that we are in a state of transition between capitalist-based enterprises and "wisdom"-based "intelprises" that engage in "persuasion and inducement through information and knowledge sharing."

If you are interested in the issues and realities that are shaping the international information infrastructure, read this book. (The MIT Press, 55 Hayward St., Cambridge, MA 02141. 1-800-356.0343, (617)625-8569) ■

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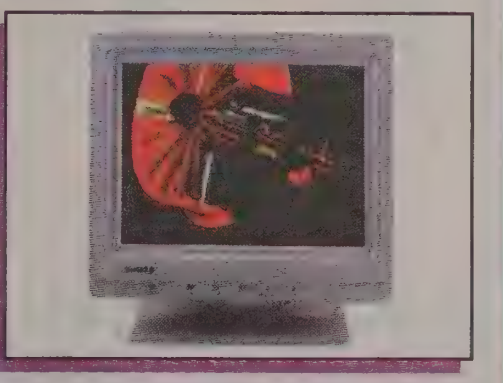

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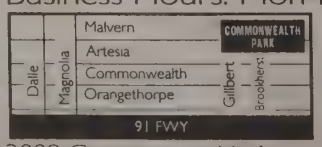

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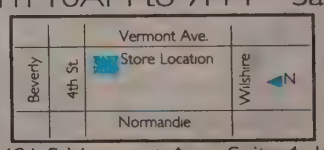

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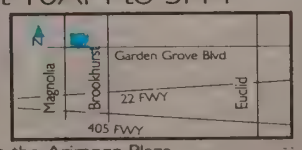

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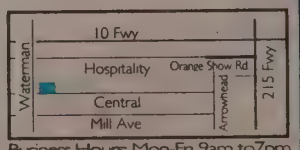

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March 20 Computer Show & Sale. Industry Hills Sheraton, City of Industry. Richard James Corp. Call: 1-800-685-1400.

March 22–25 Seybold Seminars. Boston. Seybold Seminars. Call: 1-800-488-2882.

March 26 Computer Show & Sale. Anaheim Stadium, Anaheim. Richard James Corp. Call: 1-800-685-1400.

March 29–31 Federal On-Site Technology Expo. San Diego. Federal Business Council, Inc. Call: 1-800-878-2940.

APRIL

April 4–8 System Administration, Networking, And Security Conference. Washington, DC. The Open Systems Conference Board. Call: (719)599-4303.

April 5–7 International Spectrum '94: The Business Computer Show. San Diego. IDBMA Inc. Call: (619)578-3152.

April 12 Interactive And Hollywood Computer Media Salon. Los Angeles. The American Film Institute. Call: (213)856-7690.

April 12–14 New Media Expo: The Future Of Interactive Information. Los Angeles. The Interface Group. Call: (617)449-6600.

April 16 Computer Show & Sale. CSUN, Northridge. Richard James Corp. Call: 1-800-685-1400.

April 17 Computer Show & Sale. Glendale Civic Auditorium, Glendale. Richard James Corp. Call: 1-800-685-1400.

April 18–21 EMA '94: The Annual Conference And Expo Of The Electronic Messaging Association. Anaheim. EMA. Call: (703)524-5550.

April 19–21 Networks Expo. San Francisco. Smith & Shows. Call: (201)346-1400.

April 26 Federal On-Site Technology Expo. Oxnard. Federal Business Council, Inc. Call: 1-800-878-2940.

April 27 Federal On-Site Technology Expo. China Lake. Federal Business Council, Inc. Call: 1-800-878-2940.

April 28 Federal On-Site Technology Expo. Twenty-nine Palms. Federal Business Council, Inc. Call: 1-800-878-2940.

CLASSES, SEMINARS, AND WORKSHOPS

MARCH

March 21 Basic Interactive Media Workshop: The Business. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 21 C & C++ Programming Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

March 21–22 3-D Money Making Workshop. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 21–23 Computer-Supported Cooperative Work And Groupware Class. Los Angeles. UCLA Extension. Call: (310)206-7252.

March 21–23 Intro To Programming For Microsoft Windows Using Microsoft Visual Basic 3.0 Seminar. West Los Angeles. Infotec Training Institute. Call: 1-800-282-7990.

March 22 Reinventing Hollywood Computer Media Salon. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 22 Training The Trainer Workshop. San Diego. National Seminars Group. Call: 1-800-258-7246.

March 23 Interface Design Workshop. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 23 Opportunities in Multimedia Symposium. Long Beach Airport Marriott Software Council of Southern California Call: (310)328-0043

March 23–24 Video Painting Tools Workshop. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 23–24 WordPerfect 6.0 For Windows Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

March 26 Novell System Manager. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

March 26–27 Master Class: Interactive Design With HyperCard. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 28 AutoCAD Release 12 Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

March 28 Basic Interactive Media Workshop: The Tools. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 28 Cinematography For Directors Workshop. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 28 Master Class: Adobe Photoshop Masking. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 28–29 Ami Pro. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

March 28–April 4 Supporting Microsoft Windows NT Course. San Diego. Infotec Training Institute. Call: 1-800-282-7990.

March 29–30 Master Class: Adobe Photoshop For Film And Television. Los Angeles. The American Film Institute. Call: (213)856-7690.

March 30 Free Demonstration Of Adobe Illustrator 5.0. El Camino College. South Bay Apple Mac User Group. Call: (310)644-3315.

March 30–April 1 User Interfaces—The Next Generation: Creative Design And Organizational Realities Class. Los Angeles. UCLA Extension. Call: (310)206-7252.

MARCH 30

RAP-10 MULTIMEDIA SOUND CARD DEMO

Universal City

The RAP-10, from Roland, offers the next generation of sound cards for IBM PC compatible systems to enable musicians, multimedia developers, and hobbyists to record their own audio tracks onto a hard disk, edit, and sync them with MIDI files. Roland Corp. is holding a free introduction to the Roland Audio Production card at Goodman Music in Universal City. Space is limited for the 7:00 pm event. For reservations, call: (213)845-1195.

APRIL 8–9

COMPUTER SHOW

Pomona

National Productions, sponsors of the Los Angeles Computer Fair, presents the Computer Marketplace. Over three hundred exhibits with thousands of products are featured. Seminars, for the beginner to the advanced computer user, are open to all participants and run both days. Admission is $7 and the shows are from 10:00 am to 5:00 pm. Los Angeles County Fairgrounds (Fairplex), Pomona. Call: 1-800-800-5600.

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SHOW DATES

March 19 & 20 Saturday & Sunday	**POMONA** - Fairplex (LA County Fairgrounds) Exit Highway 10 at Fairplex Drive. Go North to McKinley, turn right. Turn Left on White Avenue to Gate 14.	Admission: $7.00
April 9 & 10 Saturday & Sunday	**POMONA** - Fairplex (LA County Fairgrounds)	Admission: $7.00
May 7 Saturday	**SANTA BARBARA** - (Earl Warren Showgrounds) Highway 101 and Las Positas	Admission: $5.00
May 7 Saturday	**PAYALLUP WASHINGTON** - (Payallup Fairgrounds)	Admission: $5.00
May 8 Sunday	**BUENA PARK** - Sequoia Conference Center Take the Beach Blvd. Exit off the 91 Freeway, go one block North to 7530 Orangethorpe.	**ADMISSION FREE!**
May 14 & 15 Saturday & Sunday	**POMONA** - Fairplex (LA County Fairgrounds)	Admission: $7.00

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- MPC UPGRADE KIT
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  - Powertools, Encyclopedia, World Atlas
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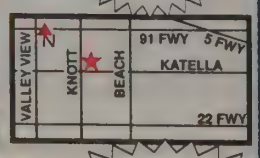

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INTERNET @ OmniComm. (310)594-6793. 14,400. WildNet & HotNet echo mail, chat, files, *Boardwatch*, *USA Today*. [Exp. #123.]

Manhattan Online. (310)374-9444. 14,400. Windows, DOS, Mac, OS/2 files, Fidonet, Internet mail, PC catalog. 2 lines, 1 hour access. Free. Sysop: Paul Swanno. [Exp. #122.]

One World. (310)372-0987. Ecology, gardening, health, alt.news, FidoNet, USENET, Internet. Free. [Exp. #123.]

the original off-off broadway BBS. (310)453-7038. 8-N-1, 24 hrs., 300/1200/2400/9600. Nonsubscription, text files/messages only. Using MajorBBS software and CompuCom Speedmodem. Sysop: James Gossage. [Exp. #123.]

2nd Amendment BBS. (310)902-0252. 24 hrs., 300/1200/2400/9600/14,400. Running TriBBS, 15+ message bases, MS-DOS files. Free. Sysop: Michael McBroom. [Exp. #122.]

The Spider's Web BBS. (310)416-9901. Online games. Message areas include BikeNet; science, SF, and Trek; recovery and 12-step; ecology and spirituality; job listings. Windows file areas. Free. Full access first call. [Exp. #123.]

619

Red Crystal Inn. (619)373-8969. 8-N-1, 24 hrs., 1200/2400/9600/14,400. Adults only. Doors, games. Free for limited use, fee to see all. Sysop: Harry B. Alls. [Exp. #121.]

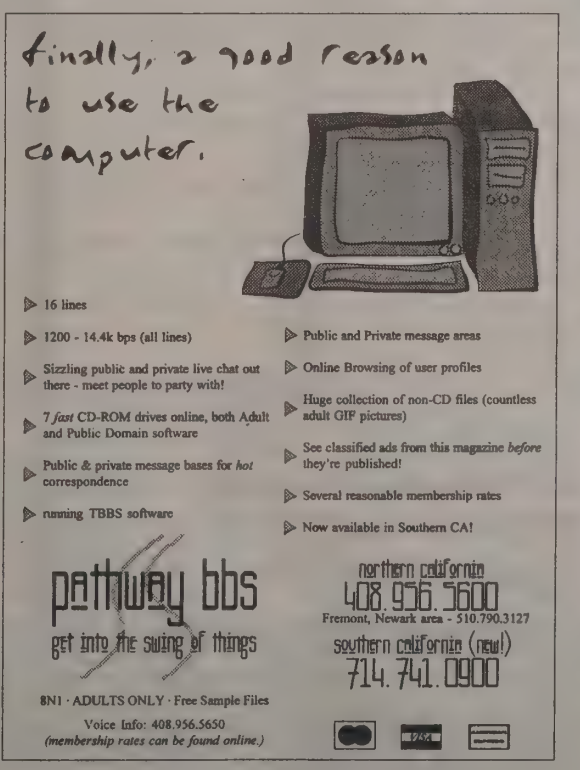
708

Mortgage Market Online. (708)834-1450. Mortage finance and real estate. 12 lines running TBBS. Sysop: Daniel Eaton. [Exp. #122.]

714

Alzheimer's BBS of O.C. (714)731-3045. 8-N-1, 24 hrs., 2400. Information on day care, support groups, respite care services, articles, and related info. Non-subscription, text

Continued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BBS Spotlight

By John Wolcott

BBSing At The Annex!

Once you've become familiar with the local free BBS, you'll be ready to appreciate all that a subscription BBS can offer. In the battle of the subscription BBSes, users are usually greeted with every feature imaginable. There is often a socialized group that welcomes newcomers and enjoys getting together for whatever social activities they can conceive. This month's BBS Spotlight features just such a subscription BBS: every feature but the kitchen sink and a more-than-friendly user group.

Having survived the Northridge earthquake, The Annex! is pleased to offer many BBS features at reasonable subscription fees. They are located in Van Nuys and offer forty-two incoming phone lines at baud rates up to 14,400bps; twenty-four of which are supported by US Robotics 14.4K Sportster modems and the remaining lines are accessed at 2400bps on Supra 2400I and SMART ONE modems. The system runs on five networked computers; four being 486 compatibles and one 386/33 CD-ROM workstation. All of this amounts to a first-class hardware setup.

On the software side, The Annex! is currently running on MajorBBS v6.12 with over seventy "add-on modules" to maximize your system usage pleasure. MajorBBS software seems to be the "latest and greatest" software available for running a full-featured BBS. Graphic formats offered here are the standard text format, ANSI graphics, and Rip Graphics. If you have not yet experienced Rip Graphics, you're in for a treat! The Rip Graphics package is available for download from The Annex! along with its own special icon package that allows you to use your mouse on the BBS. It makes BBSing far more that just a keyboard experience.

Sysops Gregory Gooden (alias Rorschach Grey) and Randy Salter (alias Blond Ambition) enjoy presenting this professional BBS. With a good deal of BBSing experience under their belts, a powerful software package at their disposal, and two years planning before launching The Annex!, Gregory and Randy do a great job of bringing you one of the best BBSes around.

When you first log on, you're asked some basic registration information. You'll also see bulletins covering upcoming user group events and system information. There is almost always a Sysop monitoring the system to speed your system validation. "Demo accounts" are available to enable your inspection of the system. Subscription rates vary depending upon your BBS needs. The rates range between $10 and $25 per month. Information for subscription terms is available from the Main Menu. Subscription rates can even be paid with a credit card or by calling a 900 number.

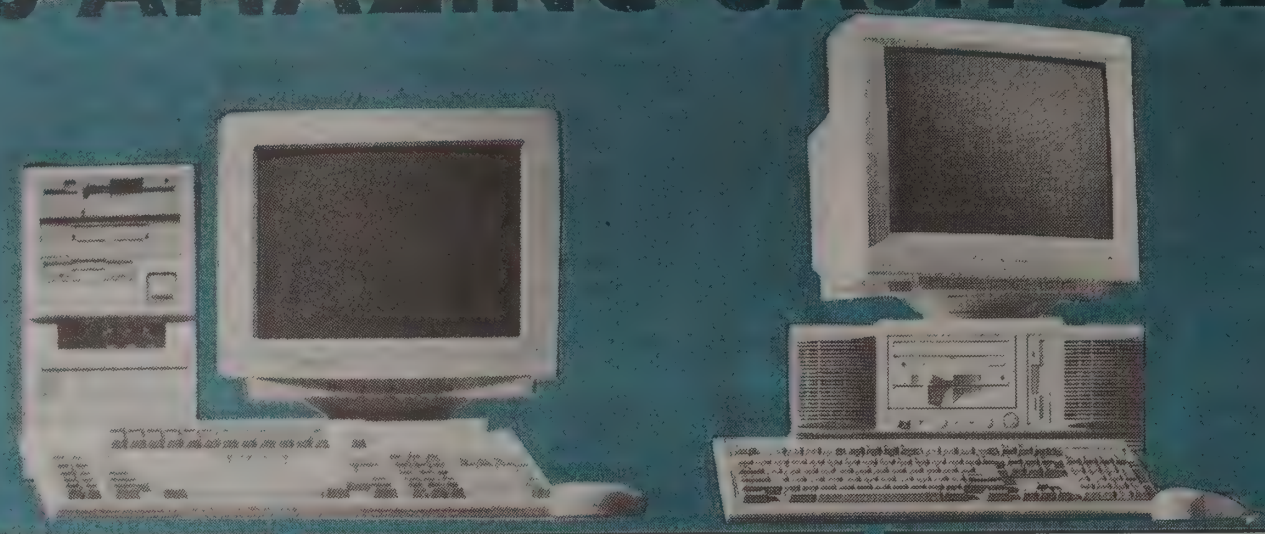
Choices from the Main Menu include: Email, System Information, Teleconference & Chat, Games & Entertainment, Registry & MatchMaking, File Libraries, Online Shopping Mall, PC Catalogue, and The Graffiti Wall. These options cover just about all you'd ever want to do with a BBS.

Email is not just limited to sending or receiving mail from other system users. Gleaning information and topical discussion from and with other BBS users spans the realms of the MajorNet and the Internet as well as the local membership. "But I've never played on the Internet before," you exclaim. Not to worry. Online help with complete information for network mail and message addressing is yours for the asking. I was pleased to encounter detailed explanations for email usage; offered directly from the messaging menus. You'll greatly broaden your experience by using the email networks. These are not just for computer information. Every topic imaginable is discussed in numerous mail forums.

System information choices from the Main Menu include news and events, basic system information, your account status, system help, and subscription information. Events for the user group are numerous, ranging from softball and bowling to pizza and pool parties. The users here go a great step beyond chatting on the BBS. It's a group of friends who enjoy computers and much more. Basic system information contains system rules for the do's and dont's. You'll want to check here for guidelines on system usage. Checking your account status and subscription

Continued

DCC's AMAZING CASH SALE!!!



PENTIUM-60 & 66MHz PCI Local Bus System

- Intel PENTIUM-60 or 66MHz Processor
- 64-bit processor complex
- 6 layer motherboard
- 3 PCI Local Bus (Bus Master slots)
- 5 EISA Bus Master slots
- HEAT-SINK w/FAN for Pentium (special heat transfer silicon to control heat)
- 256K Cache Memory
- 8MB RAM Installed (Exp. to 192MB)
- Mid Tower case w/300W UL power supply
- 1.44MB TEAC Floppy Drive
- 424MB IDE Hard Drive 12ms
- PCI IDE Floppy/Hard Drive controller card
- 2 Serial/1 Parallel/1 Game Port
- ET4000 W32P PCI Local Bus SVGA Graphics accelerator with 1MB RAM, 1280x1024
- 15" VESA Flat Screen NI SVGA Monitor,.28dp. 1280x1024, Edge-to-Edge Display
- 101 Keytronics Keyboard and Mouse
- Network-ready (w/purchase Ethernet/10BaseT)

	Regular	CASH
P5-60TE	$2749	$2649
P5-66TE	$2949	$2849

486DX-33 & 66MHz PCI Local Bus System

- Intel PENTIUM OverDrive ready, ZIF socket
- 4 PCI Local Bus (Bus Master slots), 4 ISA slots
- HEAT-SINK w/FAN for 66MHz System
- 256K Cache Memory
- 8MB RAM Installed (Exp. to 128MB)
- Mid-Tower case w/230W UL power supply
- 1.44MB TEAC Floppy Drive
- 424MB IDE Hard Drive 12ms
- PCI IDE Floppy/Hard Drive controller card
- 2 Serial/1 Parallel/1 Game Port
- ET4000 W32P PCI Local Bus SVGA Graphics accelerator with 1MB RAM, 1280x1024
- 15" VESA Flat Screen NI SVGA Monitor, .28dp. 1280x1024, Edge-to-Edge Display
- 101 Keytronics Keyboard
- Hi-Resolution Mouse
- Network-ready (w/purchase Ethernet/10BaseT)

	Regular	CASH
P433SX	$1659	$1619
P433DX	$1799	$1759
P466DX2	$1939	$1899

DCC's MULTIMEDIA EXTRAVAGANZA PAC

- Intel PENTIUM OverDrive ready, ZIF socket
- 3 VESA COMPLIANT LOCAL BUS Slots
- 256K Cache Memory
- 4MB RAM Installed (Exp. to 128MB)
- MULTIMEDIA DESKTOP CASE w/230W UL P/S
- 1.44MB TEAC Floppy Drive
- 213MB IDE Hard Drive 12ms
- IDE Floppy/Hard Drive controller card
- 2 Serial/1 Parallel/1 Game Port
- VESA Local Bus SVGA Graphics accelerator card w/1MB, 1280x1024 16.7 mill. colors
- 14" NON-INTERLACED Super VGA color Monitor, .28dp.1280x1024
- 101-Key Keyboard and Hi-Resolution Mouse
- Sound Blaster 16 (16-bit sound card)
- Panasonic CR-562 Double Speed CD-ROM
- Bundled Software - 7 CD Titles (Choose from 25 CD Titles Limited to only 1 encyclopedia title)
- Speakers & Microphone

	Regular	CASH
M433DX	$1629	$1589
M466DX2	$1749	$1739

486DX-33 & 66MHz EISA/VL-Bus System

- Intel PENTIUM OverDrive ready, ZIF socket
- 8 32-bit EISA slots (2 with 32-bit VL-Bus)
- HEAT-SINK w/FAN for 50MHz/66MHz System
- 256K Cache Memory
- 4MB RAM Installed (Exp. to 128MB)
- Mini-Tower case w/230W UL power supply
- 1.44MB TEAC Floppy Drive
- 213MB IDE Hard Drive 12ms
- IDE Floppy/Hard Drive controller card
- 2 Serial/1 Parallel/1 Game Port
- VESA Local Bus SVGA Graphics accelerator card w/1MB, 1280x1024 16.7 mill. colors
- 14" NON-INTERLACED Super VGA color Monitor, .28dp. 1280x1024
- 101-Key Keyboard
- Hi-Resolution Mouse
- Network-ready (w/purchase Ethernet/10BaseT)

	Regular	CASH
4SX-33EV	$1219	$1189
4DX-33EV	$1359	$1329
4DX-40EV	$1339	$1309
4DX2-66EV	$1499	$1469

486DX-33 & 66MHz VESA Local Bus System

- Intel PENTIUM OverDrive ready, ZIF socket
- 3 VESA COMPLIANT LOCAL BUS Slots
- HEAT-SINK w/FAN for 50MHz/66MHz System
- 256K Cache Memory
- 4MB RAM Installed (Exp. to 128MB)
- Mini-Tower case w/230W UL power supply
- 1.44MB TEAC Floppy Drive
- 213MB IDE Hard Drive 12ms
- IDE Floppy/Hard Drive controller card
- 2 Serial/1 Parallel/1 Game Port
- VESA Local Bus SVGA Graphics accelerator card w/1MB, 1280x1024 16.7 mill. colors
- 14" NON-INTERLACED Super VGA color monitor, .28dp.1280x1024
- 101-Key Keyboard
- Hi-Resolution Mouse
- Network-ready (w/purchase Ethernet/10BaseT)

	Regular	CASH
486SX-33V	$1019	$989
486DX-33V	$1159	$1129
486DX-40V	$1139	$1109
486DX2-66V	$1299	$1269

POPULAR UPGRADES FOR DCC SYSTEMS

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Orchid Fahrenheit VL-Bus	$[illegible]
Orchid Celsius w/2MB VL-Bus	199
Diamond Viper w/2.5MB VRAM VL-Bus	239
14" VESA NI Color Monitor (.28dp)	[illegible]
15" VESA Flat Screen Monitor (.28dp)	110
17" VESA Flat Screen (.26dp)	475
NEC 4FGe 15" Flat Screen (.28dp)	475
424MB 10ms IDE Hard Drive	110
545MB 9ms IDE Hard Drive	230
VL-Bus IDE cache ctrl. w/2MB	199
VL-Bus SCSI controller card	149
96/24 fax/modem w/Windows software	49
96/24 fax/modem w/Voice Mail, fax back	109
14.4 fax/modem w/Windows software	119
14.4/14.4 pocket fax/modem	179
Toshiba 3401B SCSI-2 CD-ROM 200ms	335
NEC CDR-510 SCSI-2 CD-ROM 195ms	399

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545MB 9ms IDE Hard Drive	$[illegible]25
545MB 9ms SCSI-2 Hard Drive	175
Diamond Viper w/2MB VRAM PCI	280
PCI SCSI-2 controller card	75
1.3GB SCSI-2 Conner Hard Drive	750
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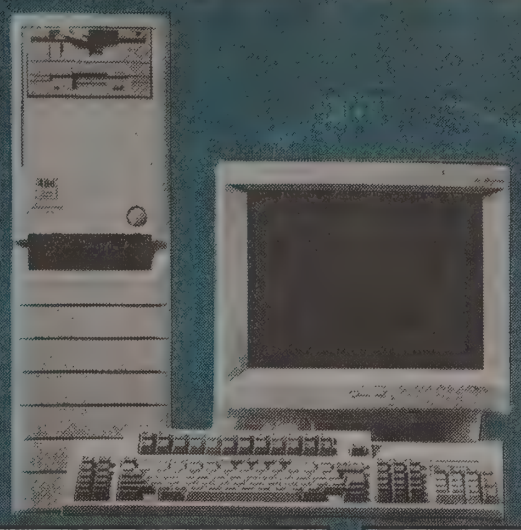

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Car Adapter	$95	Pocket Ethernet Network Adapter	$145
Laplink Cable	$25	Docking Station for VL-Bus Notebook	$490

386DX-40 SYSTEM

- 386DX-40 CPU w/128K cache
- 4MB RAM installed (Exp. to 32MB)
- Mini-Tower case w/230W UL power supply
- 3.5" 1.44MB Floppy Drive
- 170MB IDE Hard Drive
- IDE Floppy/Hard Drive controller card
- 2 Serial, 1 Parallel/ 1 Game port
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1.) 540MB data capacity
2.) 300KB/sec (double speed) transfer rate
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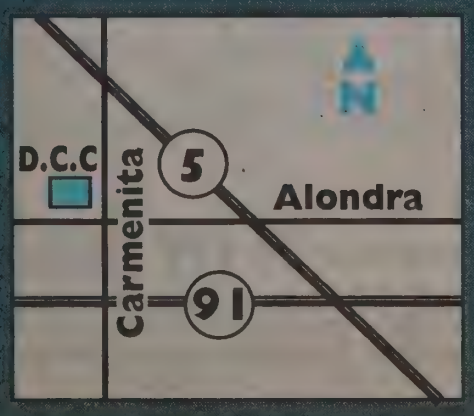
*** Bundled Software - 7 CD Titles**
1.) Software Toolworks Multimedia Encyclopedia
2.) Mavis Beacon Teaches Typing
3.) Chess Master 3000
4.) Grolier's Encyclopedia
5) Animals
6.) Secret Weapons of Luftwaffe
7.) Amplified Stereo Speakers and Microphone included



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The CyberNet BBS. (714)378-0085, 378-0741. 24 hrs., 2400–57,600. Downloads, FidoNet, Aminet, games, message bases, 15,000 Internet files online. Free. [Exp. #122.]

Free Money Manager BBS. (714)642-7627. 8-N-1, 1200/2400. Free money manager files, online support. Free. [Exp. #122.]

Homes For Sale In SoCal. (714)990-4802. 8-N-1, 24 hrs. 300/1200/2400/9600. Free. [Exp. #123.]

Korea Music Online. (714)449-9373. 14,400. Eight line multinode bilingual online service for Korean-speaking people. Korean programs, info, chat, Korea BBS list. $10/mo. unlimited access. [Exp. #123.]

MacShak BBS. (714)373-0656. 24 hrs., 2400. Newly expanded Mac, amateur radio, consumer, and adult interests. Sysop: Dude B Narley. [Exp. #122.]

OrnJuce. (714)778-1228. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. BBS of the All Computer Assoc. of Orange Co. Supporting Atari, Mac, PC, and others with message bases and file downloads. Free. [Exp. #123.]

Software Gallery BBS. (714)721-8751. 19,200. Largest file base in O.C. Adult games, graphics, CD-ROMs. No sub. required. Sysop: Joe Engebretson. [Exp. #123.]

Viewlink BBS. (714)650-4612. 8-N-1, 24 hrs., 14,400. Latest shareware, hottest adult GIFs, temp jobs. 28¢ per hour. Sysop: Terry Andrews. [Exp. #123.]

818

Alternate Lifestyles BBS. (818)287-9285. 8-N-1. No one under 21 allowed, running six lines. We cater to all sexual lifestyles. Call for free trial. [Exp. #123.]

InvestorLink. (818)331-4611. 24 hrs., 2400. Stocks, mutual funds, real estate, personal finance, daily news, commodity prices. Free. Sysop: Steve Painter. [Exp. #122.]

KBBS. (213)725-3047, (310)558-0145, (805)520-7323, (818)886-0872. 24 hrs. 68 lines, 60,000+ files, national chat all evening, free trial. [Exp. #123.]

KeyHole BBS. (818)545-0870. 8-N-1, 300/1200/2400. Bring your Mac, UNIX, DOS questions or problems to us for a solution. Free. [Exp. #122.]

Southland BBS. (818)793-9108. 14,400. Internet, email, USENET newsgroups, MUDs, chat, Linux. Sysop: Joseph Gomez. [Exp. #123.]

Valley West BBS. (818)888-8419. 24 hrs., 2400/9600/14,400. 1.5GB online RIP graphics, games, nets. Multinode. [Exp. #122.]

Wizardry BBS. (818)222-4444. 1200/4800/9600/14,400. Online games, downloads, uploads, GIFs, text files. Free. [Exp. #122.]

909

The Empire BBS. (909)980-2306. 24 hrs., 300/1200/2400. Paid: 9600-57,600. Chat, adult access, matchmaker, flower shop, free trial, files, SIGs. Sysop: [Exp. #122.]

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information will be important to be sure you have what you need to fulfill your system demands. System help is plentiful, and if the online help won't do it for you, the sysop or others users will be more than happy to jump in and give you a tip or two.

Teleconferencing is really a unique experience. Upon entering the Teleconference, you're greeted with basic information on how to get help and issue commands; followed by chatting among the users. "Micro Dude just high-fived everyone" and "Disk Jockey just slapped you silly" may be messages you'll encounter. There are special commands you may elect to enter that will invoke these clever statements. It may take a while to figure out how to structure the commands, but once you get the hang of it, it's really a blast. Whatever you type in will be seen here by everyone in the conference. If you just want to chat with an individual or two, you may invite them into a private chat forum where not everyone in the Teleconference will see what you have to say. You'll make some good friends here and have a great time doing it.

The online games will more than amuse you. Role playing with other users currently connected will take you into fantasy worlds that are fun and challenging experiences. Many games appoint the Games Menu with many of the BBS standards and all of the fantasy you can handle.

The Registry & MatchMaking will allow you to submit personal information to match your attributes with other system users. You'll be able to find other system users that share your interests and intellect. Since The Annex! has a large user base, you'll no doubt find others that meet your search criteria.

The file libraries primarily support the IBM PC and compatible format. The Annex! boasts over 3GB of files for download, and all files available have been automatically "virus scanned" for your own system's protection. Some files are available for other system platforms; such as Mac, Amiga, Atari, and Commodore. Between the regular file library and the CD-ROM files, you'll find just about any DOS format shareware or freeware application you could want.

The Online Shopping, PC Catalogue, and Graffiti Wall are not features you'll see on every BBS. Offering a new twist to your BBS experience, you'll want to investigate these areas when you've filled your need of downloads and Teleconferencing.

The Annex! can be accessed locally from many areas in greater Los Angeles. Information for numbers that are local or less expensive to call are available from the information area of the Main Menu. Using the standard connect protocols of 8-N-1, The Annex! can be reached by calling (818)786-5978 for 14.4kbps access or (818)786-5600 for 2400bps access. This BBS is a subscription bargain. ■

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486SX-33 ..... $1085
CYRIX 486DX-33 .... $1175
AMD 486DX-40 ..... $1195
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AMD 486DX-40 .... $1548
486DX2-66 ..... $1738

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Upgrade to MGA 15F ..... add 100

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AMD 486DX-40 .... $1985
486DX2-66 ..... $2175

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DTC 3685 VESA SCSI II Caching w/512K $405
DTC 3695 PCI EISA SCSI Caching w/512K $565
DTC 2181 PCMCIA SCSI Card w/cable $205
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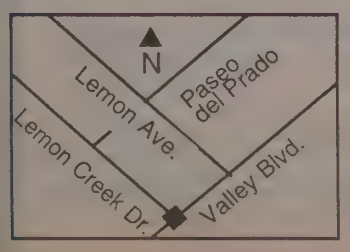

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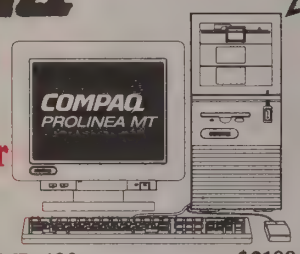

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USER GROUPS

AMIGA

Amiga User Group Of Long Beach. Meetings: 1st Thurs., 7:00 pm, 5373 E. Second St., Belmont Shores (in the Fire Station Bldg.). Call: Larry, (310)429-0752. [Exp. #123.]

ATUG—San Gabriel Valley. Meetings: last Tues., 7:00 pm, Michelangelo's Pizza, San Dimas; 3rd Sat., 11:00 am, 1st Southern Baptist Church, Temple City. Call: Steve, (818)285-6424. [Exp. #124.]

LAAUG—Los Angeles Amiga User Group. Meetings: 3rd Wednesday, 7:30 pm. Veteran's Memorial Auditorium, Overland Ave. & Culver Blvd. Super SIGs, PD disks. Call: Kip Hammond, (310)390-3010. LAAUGLine BBS: (213)387-1002. [Exp. #123.]

APPLE

Champions Of The Mac Proletariat (CHOMP). Meetings: 4th Thurs., 7:30 pm, Cal Poly Pomona. Question and answer, raffle of useful software, opportunity to purchase disks. Call: Craig Richards (909)985-7385. [Exp. #123.]

ATARI

ATESIG—Atari 8-Bit SIG. Meetings: 145 Surf Pl., Seal Beach. Cooperative group for Model Railroad applications. Call: (310)430-5433. [Exp. #123.]

COMMODORE

Commodore Technical Users Group (C=TUG). Meetings: 4th Sunday, 1:00 pm, Senior Citizen Center, 170 S. Olive St., Orange. Public domain library, documents library, and magazine. Software and hardware help. Call: Lou Palush, (714)532-1802. [Exp. #123.]

South Bay Commodore Users Group. Meetings: 3rd Thurs., 7:00 pm. S.C.E Redondo Generating Station, 1100 Harbor Dr. (across from King Yatch Harbor). Support for 64/128 computers. Open to all users of Commodore Computer equipment and those who would like to receive or exchange information on programs, applications, or hardware. Call: Dave LeGalley, (310)324-8357. [Exp. # 123.]

CORELDRAW

Corel (ACAD)User Group. Meetings: 2nd to last Tues., 7:00 pm, Glendale Federal Bank Building, 401 N. Blvd. Product demos, Q&A. Call: Art, (213)935-1958. [Exp. #124.]

IBM & COMPATIBLES

Greater South Bay PC User Group. Meetings: 2nd Thurs., 7:30 pm, Torrance Recreation Center located behind the main city library, Torrance. Visitors welcome. Call: (310)329-2804. [Exp. #124.]

Long Beach IBM PC And Compatibles User Group. Meetings: 3rd Wed, 7:00 pm, Masonic Temple, 1120 E. Market St., Long Beach. Novice and experienced welcome. $25/yr, $35 for a family. Call: Jim Wells, (310)439-7114. [Exp. #121.]

Orange County IBM PC Users Group. Meetings: 2nd Tuesday, 6:30 pm. Computer Learning Center, 1240 S. State College Blvd., Anaheim. Speakers, software, newsletter. Open to public, all welcome. Call: (714)990-0580 [Exp. #123.]

Pasadena IBM User Group. Meetings: 3rd Wed., 7:00 pm, 2184 N. Lake Ave., Altadena. Speakers on hardware/software, SIGs, library, newsletter, and BBS. Call: Steve Bass, (818)791-1300. [Exp. #123.]

Thousand Oaks Personal Computer Club (TOPCC). Meetings: 3rd Thurs., 6:30 pm, Goebel Senior Adult Center, 1385 E. Janss Rd., Thousand Oaks. Call: (805)523-1924. [Exp. #123.]

TUG-NET. Meetings: Every Thurs., 7:00 pm, Glendale Federal Bank, 7119 Topanga Cyn., Canoga Park. Ample parking. Call: (818)249-1629. [Exp. #126.]

Valley Computer Club. Meetings: 1st Wed., 7:00 pm, Glendale Federal Bank, 7119 Topanga Cyn., Canoga Park. BBS, PD library, SIGs, newsletter. All welcome. Call: Estella McClintock, (818)848-1948; or Grayce Hruda, (818)842-3707. [Exp. #123]

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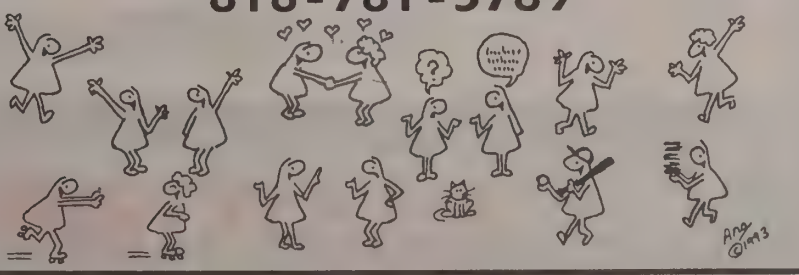

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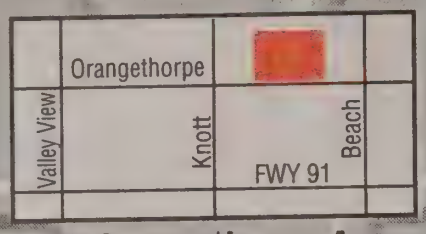

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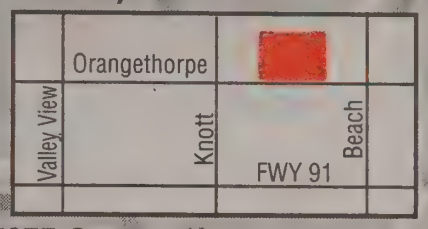

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Panasonic KX-P2123 Quiet Printer (24pin/240cps/80col/color opt)	$245/$240
Color kit for the above printer	$45/$43

KEYBOARDS

	regular/CASH
Lite-On 4100 101 enhanced keyboard (non-click)	$22/$21
AST KB-101 enhanced keyboard (non-click)	$40/$37
Focus 2001 101 keyboard (click, hard dustcover)	$42/$40
KME keymouse 101 keyboard (click, track-ball built-in)	$62/$60

CASES

	regular/CASH
CPU cooling fan (INTEL 486)	$18/$17
Mini-tower case (200w ps)	$45/$43
Mini-desktop case (200w ps)	$65/$62
Mid-tower case (230w ps)	$69/$67
Full-tower case (250w ps)	$89/$87

MOUSE/TRACKBALL

	regular/CASH
Serial mouse, M.S. compatible	$20/$19
TrueDox Trackball (50-800 dpi, 3 button)	$35/$33
Microsoft serial mouse	$53/$50
Microsoft bus mouse	$65/$63

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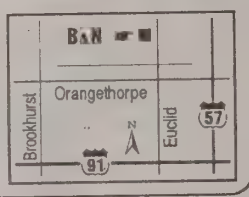

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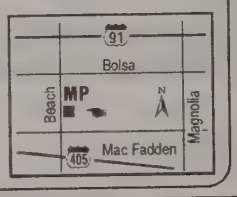

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USER GROUPS continued...

KAYPRO

KAYOS Kaypro User Group. Meetings: 4th Mon. of even months, 6:00 pm, El Segundo Library. Call: (310)379-8339. [Exp. #124.]

MACINTOSH

Champions Of The Mac Proletariat (CHOMP). Meetings: 4th Thurs., 7:30 pm, Cal Poly Pomona, grey building near administration building, rm. P2-7. Call: Craig Richards (909)985-7385 or Mitch Cohen, (909)598-5766. [Exp. #123.]

South Bay Apple Macintosh User Group. Meetings: Last Wed., 8:00 pm, El Camino College, MCSC Rm. 160, 16007 Crenshaw Blvd., Torrance. Call: (310)644-3315. [Exp. #123.]

West Orange County Macintosh User Group (WOCMUG). Meetings: last Tues., 7:00 pm, Carver Elementary School Auditorium, 5335 E Pavo St., Long Beach. Come and join with other Mac Users to share knowledge and experiences. Call: Lynn Goodrich (714)892-8910 or Tony Muller (310)493-1240. [Exp. #123.]

PROGRAMMING

Software Toolsmiths. Meetings: Last Sat., 10:00 am, Joslyn Center, 339 Sheldon St., El Segundo, CA. Discussion and tutorials on programming, including C++, Forth, J, Smalltalk, algorithms, operating systems, and hardware. Neophytes welcome. Call: John LuValle, (818)797-1820, or Howard Rogers, (310)532-3342. [Exp. #124.]

ASSOCIATIONS

All Computer Association Of Orange County. Meetings: 2nd Sun., 1:00 pm, Fullerton Savings, 12860 Euclid Ave., Garden Grove. Call: (714)960-6111. Supporting Atari, Mac, PC, and other systems. [Exp. #126.]

Independent Computer Consultants Association, Los Angeles Chapter. Meetings: 1st Thurs., 6:00 pm. Prepaid reservation, $25, or at the door, $35. The LA chapter provides referral services. Call: (213)872-1811. [Exp. #124.]

Orange County Independent Computer Consultants Association. Call: (714)552-2384. [Exp. #121.]

Southern California Computer Society. Meetings: 4th Tues., 7:00 pm, Farmers & Merchants Bank, 12535 Seal Beach Blvd., Rossmoor, on southern side of Rossmoor shopping area. Call: Hank Burwash, (310) 596-9670. We welcome all who are interested in computers. BBS and monthly newsletter. $15 dues per year. [Exp. #124.]

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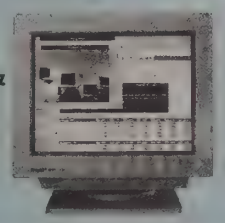

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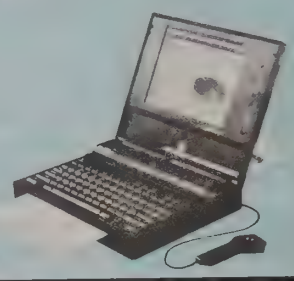

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- 1 Serial, Parallel, VGA, Mouse,
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- Build-In Trackball mouse in center
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488SX-25 4MB,120MB	$1489	$2150

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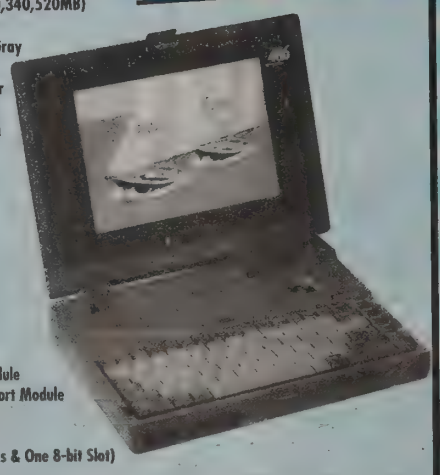

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- Trackball (Standard) Module
- Fax/Modem (9600/2400bps) Module
- Lan Adapter Module / 2nd Serial Port Module
- PCMCIA* Type II Interface Module
- Scanner Module / SCSI Module
- AT Expansion Box (Four 16-bit Slots & One 8-bit Slot)

	MONO	DUAL SCAN COLOR	ACTIVE COLOR
486SX-33, 4MB/170MB	$1525	$2095	$3055
486DX-40, 4MB/170MB	$1625	$2200	$3165
486DX2-66, 4MB/170MB	$1845	$2415	$3375

FB-300 Multimedia Notebook

LOCAL-BUS

PCMCIA

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- 9.5" VGA Display (CCFT,
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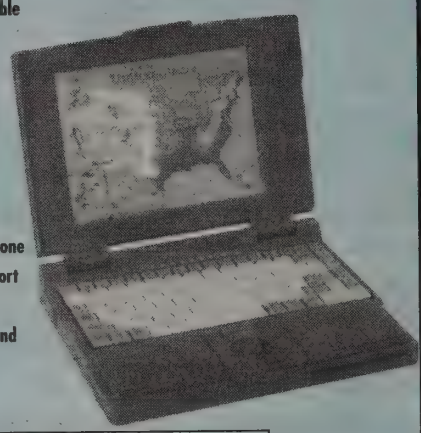
- Intel 486SL, SX and DX Upgradable
- 4MB RAM Expandable to 32 MB
- Phoenix BIOS
- 3.5 Removable Floppy Drive
  Exchangeable to second battery
- Built-in speaker, microphone and
  25mm Super Trackball
- 1 Parallel, 1 Serial, 1 Line-in,
  1 Line-out audio Jack, 1 Microphone
  Jack, external VGA, Keyboard Port
- PCMCIA Slot Type III
- 6 lbs with Battery Optional second
  battery, Docking Station,
  Sound Card and Pen Map



SL ENHANCED	MONO	DUAL SCAN COLOR
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486DX-33 4MB/250MB	$1835	$2445
486DX2-66 4MB/250MB	$2085	$2695

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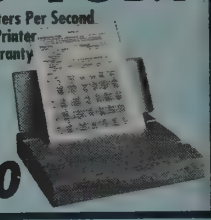

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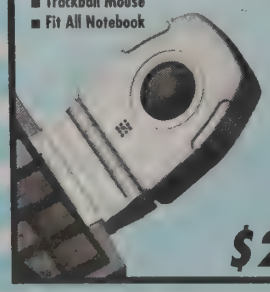

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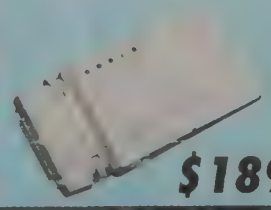

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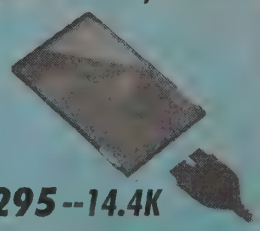

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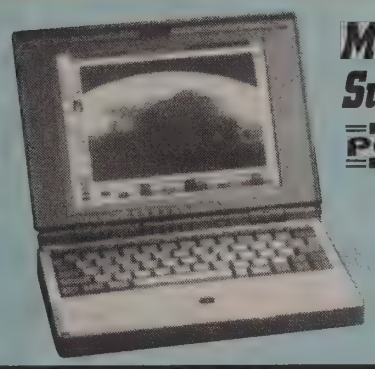

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- 1 Serial, 1 Parallel Mouse
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- 83-key keyboard
- Lightweight: 5.5lbs
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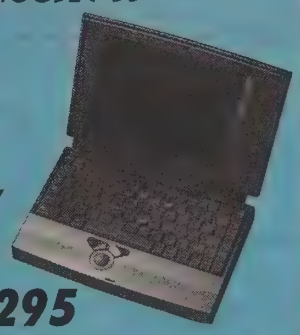

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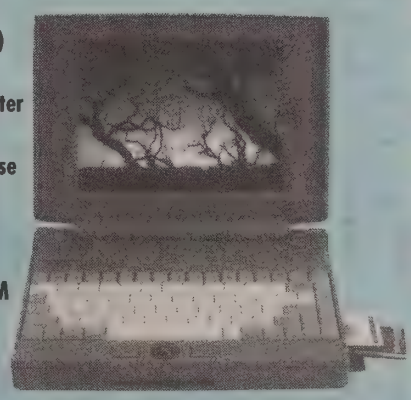

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486DX-33, 4MB,250MB	$1856	$2395	$3415
486DX2-66, 4MB,250MB	$2045	$2585	$3595

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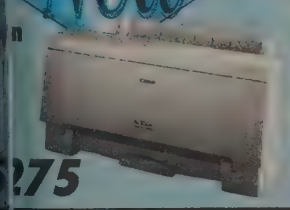

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BJC-600 PERSONAL COLOR PRINTER

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- Prints 360 dpi on Plain Paper for Brilliant Color Quality
- Doubles as a Laser Quality, Black & White Printer
- Individual Ink Cartridges
- 100 Sheet Feeder for Letter, Legal, Envelopes
- 20 Scalable True Type Font
- 2 Year Warranty

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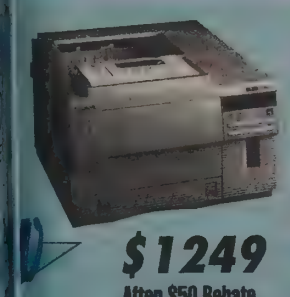

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Same as HP 4L

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- 22 Fonts (8 Scalable)
- 1Mb up to 5Mb
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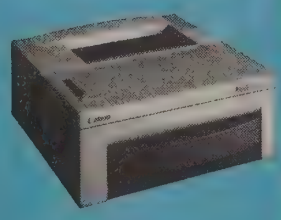

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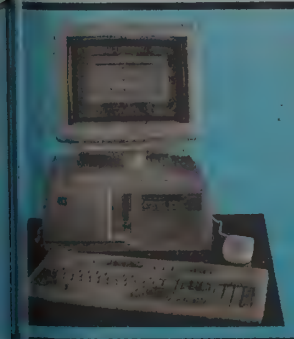

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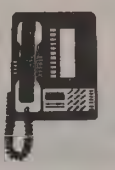

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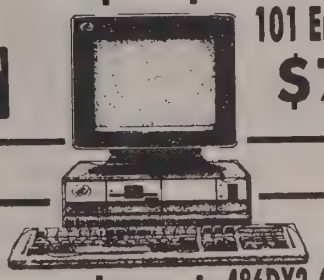

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- ❑ VLB 32 Bit Graphic Accelerator w/1MB DRAM
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- ❑ Mini Size Tower Case
- ❑ Enhanced 101 Keys Keyboard
- ❑ Serial Mouse

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25MHz $999

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- ❑ VLB 32 Bit Graphic Accelerator w/1MB DRAM
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- ❑ Mini Size Tower Case
- ❑ Enhanced 101 Keys Keyboard
- ❑ Serial Mouse

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- ❑ VLB 32 Bit Graphic Accelerator w/1MB DRAM
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- ❑ 14" SVGA N-I .28mm Monitor
- ❑ Full Size Tower Case
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- ❑ Serial Mouse
- ❑ Spectrum 16 Sound Board
- ❑ Sony Double-Speed CD-ROM
- ❑ 6 Multi Media CD Titles
  MS Windows, MS Bookshelf, MS Works, King's Quest V, Mixed-up Mother Goose, Thunder Media Sound Library

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- ❑ 8MB RAM, 128KB Cache
- ❑ 1.44MB Floppy Drive
- ❑ 420MB 13ms IDE Hard Drive
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- ❑ 15" SVGA N-I .28mm Monitor
- ❑ Full Size Tower Case
- ❑ Enhanced 101 Keys Keyboard
- ❑ Serial Mouse
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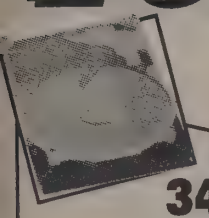

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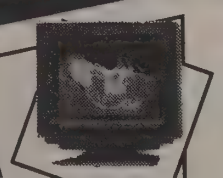

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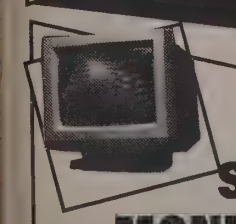

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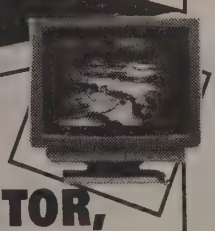

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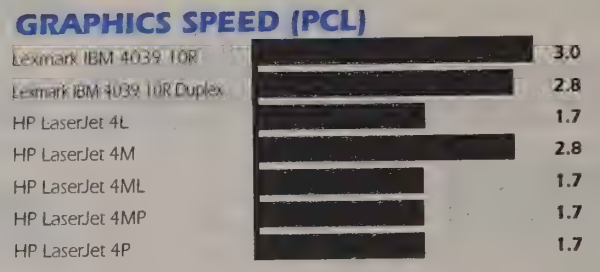

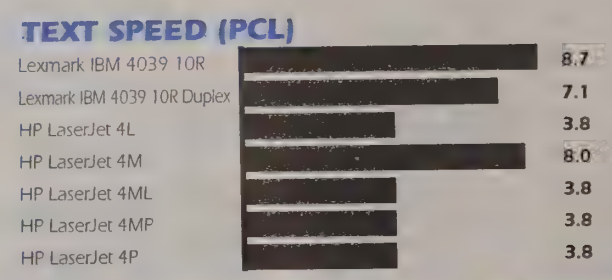

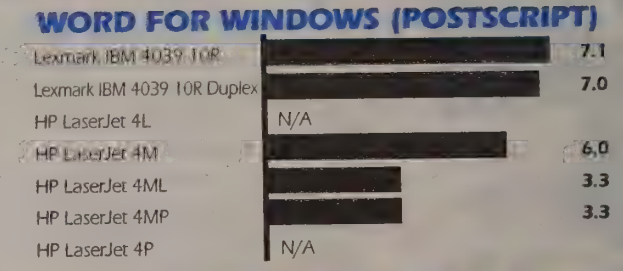

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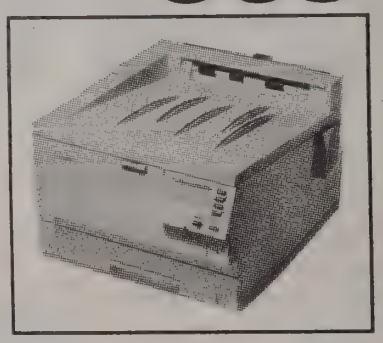

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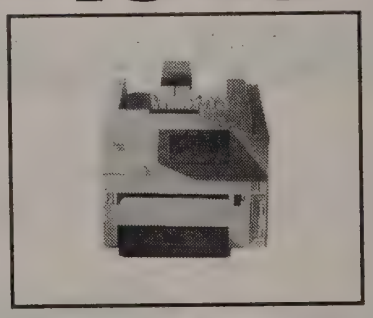

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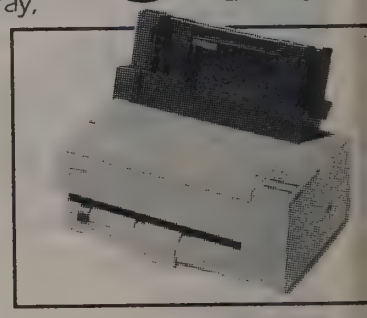

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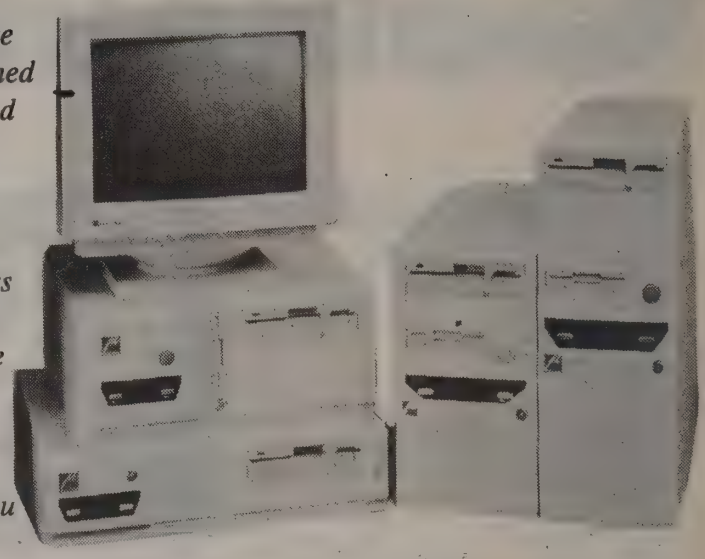

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MULTIMEDIA 101

Fabrice Florin & The Heartbreak Of CD-ROM

BY JONATHAN E.

Wacky Jacks and *Travelrama USA* are a pair of newly released CD-ROM titles from StarCore, Apple's software publishing and distributing group in its Personal Interactive Electronics division. Fabrice Florin is the executive producer of both CD-ROMs. This might surprise you if you were to read a couple of postings he made in the summer of 1991 to "The Heartbreak of CD-ROM" topic of The WELL's Muchomedia conference. At that time, the multimedia potential of CD-ROMs was so muddy that his powerful and emotionally intense statements epitomized the dissatisfactions currently inherent to the medium. There are many still suffering from that heartbreak and, interestingly, the topic has recently come alive again with new postings. Florin, however, has found a way to get around CD-ROMs' limitations, and these two titles demonstrate valuable lessons in what can be done and how it can be done.

This is worth remembering as recognition, or acknowledgement, of the roller-coaster ride most multimedia pioneers have experienced over the past several years. Early theories and hopes have crunched up against then-current technological reality, hyped-up publicity has outstripped any actual delivery, and only now are some technology and markets becoming reality, only now is at least some authentic delivery being made on some of yesterday's promises. Meanwhile, new visions of multimedia's potential have been formulated and new promises have been made. Only one thing seems clear and that is that the job of sorting out the fanciful exaggerations from the facts of the technological and communications evolution (or is it a revolution?) we are experiencing is a long way from over.

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A LITTLE HISTORY

Born in France, Florin has a long involvement with new media on this side of the Atlantic. A recent conversation with him provided insight into both his career path

and the issues that all content developers must contend with. In the late '70s and early '80s, he was head of Videowest Productions, Inc., producing youth-oriented, magazine-style programming for ABC, MTV, and the USA Cable Network as well as music videos for record labels.

He got into computer multimedia just as it began to make its long slow march from the gleam-in-the-eye stage towards reality. He explains, "I always was curious about what would happen when computers and video converged. In order to pursue that interest I produced a documentary on computer hackers back in 1984, based on the first Hackers Conference, which *Whole Earth Review* organized. I interviewed twelve different hackers, not the cracker-types but the midnight programmers.

"The twelth individual was Bill Atkinson. Bill was, at the time, talking about this vision that he had of types of programs that would let you experience entertaining adventures, that would let you bounce around from one node of information to the other and turn learning into fun. The basic concept was that you'd blend entertainment and information together. His words kept echoing through my head long after the interview was over and I thought, 'I could do something like that.'

"That's where I came up with the idea of an electronic atlas, which would allow you to circumnavigate the globe until you found an area of interest, zoom down to that particular place, and view the creatures and cultures that inhabit it, sort of a cross between *Powers of Ten* and *Family of Man*. I basically designed the blueprint for this, sent it off to Bill, and said, 'I bet you you can't do this on your Macintoshes. You got any idea of what technology would be available to do this stuff?'

"Lo and behold, it turned out that Bill was actually designing Wild Card, which was to become HyperCard. He left a message on my home machine, and one on my work machine, to say 'We've got to get together' because the diagrams that I'd sent him were card-based. Essentially they described how you might be able to put together an electronic atlas with a series of 'cards' that were all tied to each other programmatically.

"Basically what that did was to provide him with the impetus to go ahead and get over the writer's block that he was experiencing at the time and deliver HyperCard because he had a user that needed it so badly—the prototypical author, multimedia author, yours truly. So he made me an offer that I couldn't refuse, which was that I would get Wild Card three years before anybody else, that he would write little special drivers to help me mock up a video disc-based prototype.

"I ended up developing the first multimedia application of HyperCard. Every two weeks I would go to his house. I'd show him how I was doing, I'd tell him what I hated and loved about the program. He'd fix it and improve it. There was a great symbiotic relationship between the prototypical application developer and the toolmaker.

"That lead to Apple making me another offer I couldn't refuse—to license rights to the prototype and have me become one of the founding members of the Multimedia Lab, which I did in '86.... Basically, we tried to figure out what this multimedia thing was all about. We were probably the first ones to use the word multimedia. I don't claim any credit for it—I still think it's an awful word.... We focused on multimedia in education, did very interesting R&D for several years, came up with interesting prototypes and some actual products like the *Visual Almanac* and *Life Story*, which are in schools now and are being used—prototypical examples of what can be done with this in education. Then, in 1991, I was asked by Apple to form a spin-off unit to focus on consumer applications of these beautiful multimedia technologies. The idea was that we would be production oriented, that we would produce actual CDs as well as vision pieces and mock-ups of interactive TV applications."

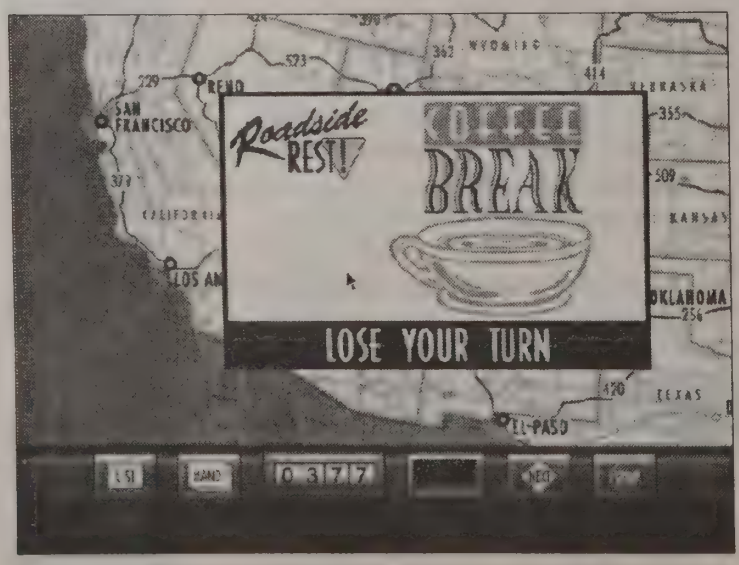
WHAT THE CONSUMER WANTS

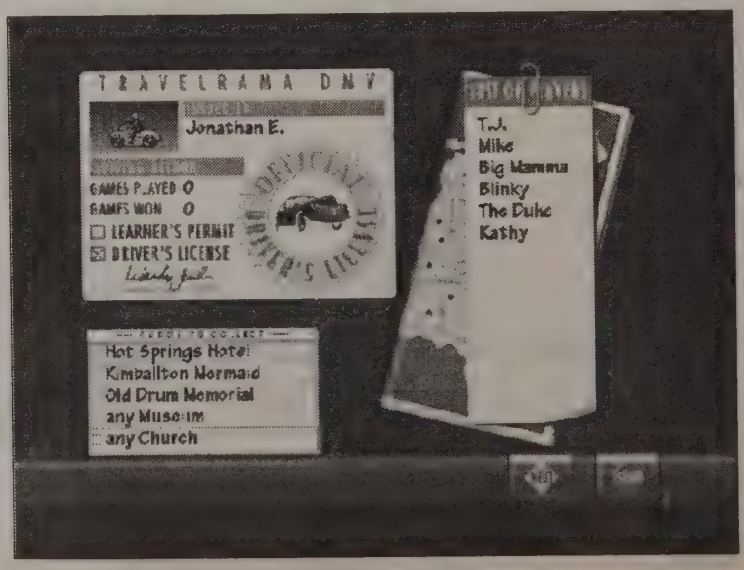
In order to produce CD-ROMs that would be successful in both today's marketplace and tomorrow's, a lot of user testing was done. Florin explains, "That involved designing remote controls, designing screens, designing what the end-user application is. When you're essentially competing with NBC, ABC, CBS, what does the customer want you to do with this interactive technology?

"Finally, last year we felt that the time was right to start putting out some of the products we had been working on. So we released those first two titles, *Wacky Jacks* and *Travelrama*. We applied some of the lessons we'd learned from our interactive TV research, which is, first, that most of our customers expect these multimedia experiences to play on their TV ultimately. They're willing to use them on their PC or Macintosh for now, but the computer den in the home is not the ideal place for multimedia experience. People would expect to enjoy them in the family room or in the living room where it can become a group experience, not just a solitary experience.

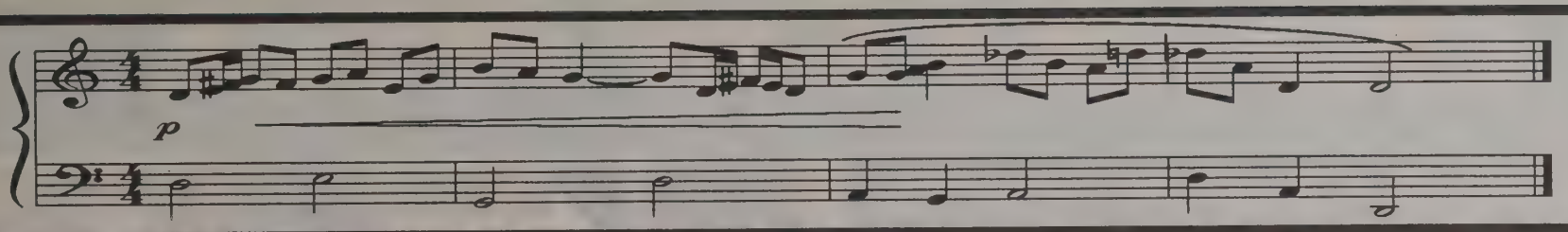
"So we focused on titles that encour-

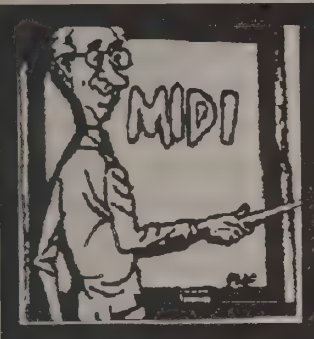
Continued on page 146





Left: screen shots from Travelrama USA.





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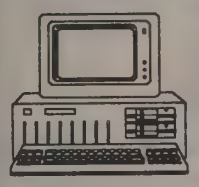


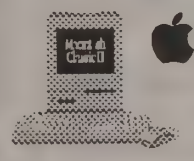
Complete System!

CD Rom w/Free CDs, Speakers & More!

486DX-33 CPU
1meg video
1024x768 monitor
230mgHD
keyboard
mouse
Dos 6.2
Windows 3.1
PC200mkII Midi Kybd
SndBlaster Mult. Kit
Installation & Training

$2099

Apple® Peavey®



Music Starter System

Color Classic 4/80
EZ Music Starter Kit:
Book of Midi
EZ Vision
Band in a Box
Interface
Peavey DPM2
260 Drum Patts
Installation
Training Included

$2299
Complete with Velocity, Multitimbal Keyboard

SAVE $1300!

Atari Seminar

w/ Factory Rep
Mar 16 5 & 7 PM
8 Tracks Digital Audio System

Mackie Mixers

On Sale from $319

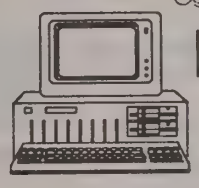
Peavey Keyboards from $799

Roland Keyboards from $199

PC

turtle beach systems

Roland



Monterey Midi System

486DX-33 CPU
1meg video
1024x768 monitor
340mgHD
keyboard
mouse
Dos 6.2
Windows 3.1
PC200mkII
Cakewalk Win
Installation & Training

$2999

Plays 2 Tracks of Digital Audio w/4 meg rom of Sample Sounds w/ EFX!

The Latest Products & Largest Inventory of Music Software!

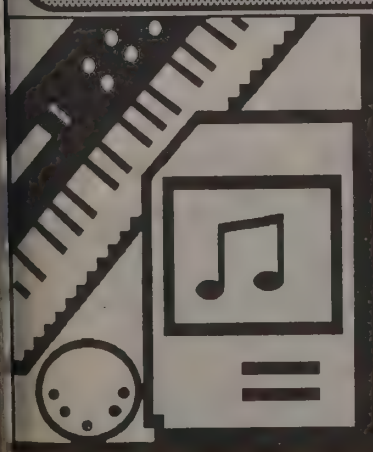
- Spanish Master Tracks Sale
- Academic Finale $250
- Steinberg Cubase PC $219
- Roland RAP-10 SALE
- Over 100 Midi Help Books!
- Dr Synth & SCC1 Sale
- Cakewalk 4.0 Seq $99
- Band in a Box Pro $69
- PowerTracks Seq $29
- Midi Interfaces from $25
- Noatation Prgm from $50
- Peavey DPM 3se $1695
- Passport Producer Pro Sale
- General Midi Files from $12
- Turtle Beach Maui In Stock
- SAW 8 Track softwr $499
- Atari Falcon 030 $799
- Roland JV80 Price Too Low to Print

Mac/PC Session In Stock

Encore & Master Tracks Both for $399

8 REASONS TO PURCHASE FROM US:

1. FREE Phone Support on Products purchased from us.
2. EZ Financing & Leases
3. Over 1000 Midi Programs!
4. Private Tutoring in your home or studio by the experts
5. FREE Monday Nite Midi Introduction Seminars
6. Notation & Sequencer Classes
7. Finale User Grp meet 4th Wed
8. Computer Swapmeet in Pomona March 19 & 20



The Electronic Music Box

14947 Ventura Blvd. Sherman Oaks

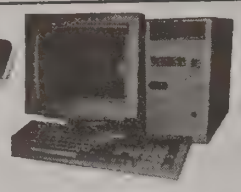
(818) 789-4250

-Music/Midi BBS (818) 789-4287

Everyday Low Prices,

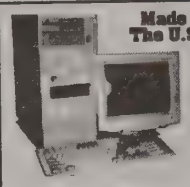
Pre-Bundled System Specials

$999 — 486/33 Local Bus



System Includes:
- Opti 486VLB MB w/128k Cache w/ 2VLB Slots
- Intel 486SX 33Mhz CPU, 4MB Ram
- TEAC 1.2Mb & 1.44Mb Floppy Drives
- 210Mb Hard Drive w/ VLB IDE Cntrlr.
- Trident 9200 VLB 1Mb Accelerator
- Infinity IE1439SV 14" SVGA Monitor
- 2 Serial, 1 Parallel, 1 Game Ports
- CS-609T Mini-Vert. Case w/230W. PS
- Chicony 5311 101 Key Keyboard

$1399 — 486DX2-50 Local Bus



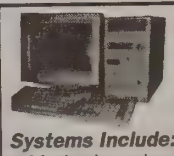
System Includes:
- Vega 486VLB MB w/256k Cache 3VLB Slots, ZIF Socket
- AMD 486DX-2 50Mhz CPU, 4MB Ram
- TEAC 1.2Mb & 1.44Mb Floppy Drives
- 250Mb Hard Drive w/ VLB IDE Cntrlr.
- WD90C33 VLB 1Mb Accelerator
- Infinity IS1528N5 15" SVGA Monitor
- 2 Serial, 1 Parallel, 1 Game Ports
- CS-230 Mid-Vert. Case w/250W. PS
- Chicony 5311 101 Key Keyboard

386DX-40 / 486DLC-40

386DX-40	$989
486DLC-40	$1039

Systems Include:
- Motherboard w/CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb Fdd
- IDE Hdd Controller
- 2 Ser, 1 Par, 1 Game
- 210Mb IDE Hard Drive
- T8900 SVGA Card
- Digiview 1401 Monitor
- Mini-Vertical Case w/230W P.S.
- 101 Key Keyboard
- Includes DOS

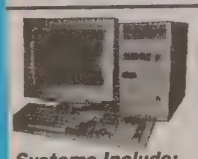
MADE IN THE U.S.A. IBM 486SLC2-66 VLB



486SLC2-66	$1259

Systems Include:
- Motherboard w/CPU & Math-Coprocessor
- 4Mb Ram
- 1.2Mb & 1.44Mb Fdd
- 32-Bit VLB IDE Hdd/ Fdd Controller
- 200Mb IDE Hard Drive
- GD-5428 VLB 1Mb SVGA Accelerator
- Digiview 1431 Mntr.
- 2Ser, 1Par, 1Game
- Mini-Vertical Case w/230W P.S.
- 101 Key Keyboard
- Includes DOS

486 VLB Multi-Media



486DX2-66	$1869
486DX2-50	$1739
486DX-40	$1729
486DX-33	$1739
486SX-33	$1609
486SX-25	$1569

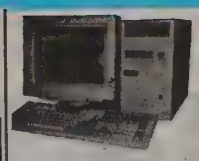
Systems Include:
- 486 VLB Mbd w/ 256K Cache, ZIF Socket & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb
- 32-Bit VLB IDE Hdd /Fdd Controller
- 250Mb IDE Hdd
- WD90C33 VLB 1Mb Accelerator
- Optiquest 2000DX 15" Digital SVGA NI Color Monitor
- 2Ser,1Par,1Game
- ProAudio Spectrum 16
- Sony 33A 2X CD-Rom
- CS-150 Speakers
- 4 CD-Titles
- Mini-Vertical Case w/ 230W. P.S.
- 101 Key Keyboard
- Includes DOS

MADE IN THE U.S.A. 486 VLB Multi-Media

486DX2-66	$2469
486DX2-50	$2339
486DX-40	$2329
486DX-33	$2339

Systems Include:
- VEGA 486 VLB w/256K Cache, ZIF Socket & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb
- 32-Bit VLB IDE Hdd Controller
- 340Mb IDE Hdd
- Orchid Fahrenheit VLB 1Mb SVGA Accelerator Card
- ViewSonic 15E 15" SVGA NI Monitor
- ProAudio Spectrum 16
- Toshiba 3401 Internal 200ms, 2X CD-Rom
- CS-800 Speakers
- 6 CD-Titles
- 2Ser,1Par,1Game
- Mid-Vertical Case w/ 250W. P.S. & 2 Fans
- 101 Key Keyboard
- Includes DOS

486 VLB SX/DX/DX2



486DX2-50	$1299
486DX-40	$1319
486DX-33	$1339
486SX-33	$1199
486SX-25	$1169

Systems Include:
- 486 VLB Mbd w/ 128K Cache & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb Floppy Drives
- 32-Bit VLB IDE Hdd /Fdd Controller
- 250Mb IDE Hdd
- 32-Bit Trident T9400 VLB 1Mb SVGA Accelerator
- Optiquest 1000S 14" SVGA NI Color Monitor
- 2Ser, 1Par, 1Game
- CS-609T Mini-Vertical Case w/230W. P.S.
- 101 Key Enhanced Keyboard
- Includes DOS Operating System

486 VLB DX/DX2

486DX2-66	$1599
486DX-50	$1669
486DX2-50	$1479
486DX-40	$1499
486DX-33	$1519

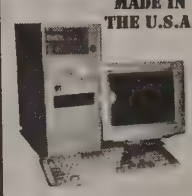
Systems Include:
- 486 VLB Mbd w/ 256K Cache, ZIF Socket & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb Floppy Drives
- 32-Bit VLB IDE Hdd /Fdd Controller
- 340Mb IDE Hdd
- 32-Bit WD90C33 VLB 1Mb SVGA Accelerator
- Optiquest 2000DX 15" Digital FST SVGA NI Monitor
- 2Ser, 1Par, 1Game
- CS-609T Mini-Vertical Case w/230W. P.S.
- 101 Key Enhanced Keyboard
- Includes DOS Operating System

MADE IN THE U.S.A. 486 VLB DX/DX2

486DX2-66	$1749
486DX2-50	$1639
486DX-40	$1649
486DX-33	$1669

Systems Include:
- VEGA 486 VLB w/256K Cache, ZIF Socket & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb Floppy Drives
- 32-Bit VLB IDE Hdd /Fdd Controller
- 340Mb IDE Hdd
- Orchid Fahrenheit VLB 1Mb SVGA Accelerator Card
- ViewSonic 15E 15" Energy Saving FST SVGA NI Monitor
- 2Ser, 1Par, 1Game
- Mid-Vertical Case w/ 250W. P.S. & 2 Fans
- 101 Key Keyboard
- Includes DOS

MADE IN THE U.S.A. 486 PCI/VLB DX/DX2



486DX2-66	$2089
486DX2-50	$1979
486DX-33	$1949

Systems Include:
- VEGA 486 PCI/ VLB w/256K Cache, ZIF Socket, 4PCI - 3VLB Slots & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb Floppy Drives
- 32-Bit PCI IDE Hdd /Fdd Controller
- 340Mb IDE Hdd
- Orchid Kelvin 64 PCI or Hercules Dynamite PCI SVGA Accelerator Card
- ViewSonic 15 15" Digital Energy Saving FST SVGA NI Monitor
- 2Ser, 1Par, 1Game
- Mid-Vertical Case w/ 250W. P.S. & 2 Internal Cooling Fans
- 101 Key Keyboard
- Includes DOS

MiTAC 486/33 Color

$1788

Features: Intel 486SX 33Mhz CPU, 4mb RAM, 120mb HDD, 5.9lbs, Digital Controls, Passive Matrix Color, Windows Accelerator, Built-In Trackball, Optional Mini-Docking Station

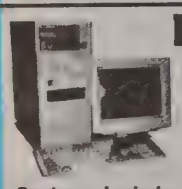
486/25 Mono Version $1288.

MiTAC 486/25 Subnotebook

$1399

Features: Intel SL Enhanced 486SX-25Mhz CPU, 4mb RAM, 130mb HDD,Built-in "Palm Rest" Trackball, 9.5" 64 Gray Scale Dual Scan LCD Display, Removable Drive System, **2 PCMCIA Slots.**

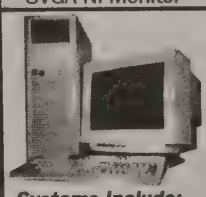
Intel Pentium 60Mhz PCI Bus



$2699

Systems Include:
- Intel Pentium PCI Mbd & Intel Pentium 60Mhz CPU w/256K Cache & 8Mb RAM
- 1.2Mb & 1.44Mb Floppy Drives
- Onboard PCI IDE Hdd/Fdd Controller
- 540Mb IDE Hard Disk Drive
- Diamond Viper PCI Graphics Accelerator Card (Super Fast! Over 80 Million Winmarks)
- CS-230 Mid-Vertical Case w/250Watt P.S. and 2 Super Cooling Fans
- 101 Key Enhanced Keyboard
- Includes DOS. *Monitor not included*

Pentium VLB/PCI Bus



Pentium-66	$3599
Pentium-60	$3499

Systems Include:
- Opti Pentium VLB Mbd & Intel Pentium 60Mhz CPU w/512K Cache & 8Mb RAM
- 1.2Mb & 1.44Mb Floppy Drives
- Adaptec 2842K VLB SCSI Controller
- 1.08Gb SCSI-2 Hard Disk Drive
- Diamond Viper PCI Graphics Accelerator Card (Fastest 2Mb VLB Card on the Market.)
- CS-300GTS Full-Vertical Case w/300Watt P.S. and 2 Super Cooling Fans
- 101 Key Enhanced Keyboard
- Includes DOS. *Monitor not included*

AIR Advanced Integration Research, Inc. VESA Local Bus

486DX2-66	$1879
486DX2-50	$1769
486DX-40	$1779
486DX-33	$1799
486SX-33	$1659
486SX-25	$1629

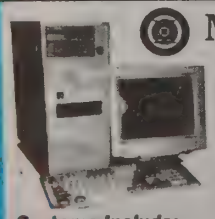
Systems Include:
- AIR 486VLB w/256K Cache, ZIF Socket & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb
- 32-Bit VLB IDE Hdd Fdd Controller
- 420Mb IDE Hdd
- Orchid Kelvin VLB Accelerator Card
- ViewSonic 15 15" Energy Saving FST
- 2Ser, 1Par, 1Game
- CS-230 Mid-Vertical Case w/250Watt P.S.
- 101 Key Keyboard
- Includes DOS

Kenitec NP-602 486/33 Notebook

$1199

Features: Intel SL Enhanced 486SLC-33Mhz CPU, 4mb RAM, 130mb HDD,Built-in "Palm Rest" Trackball, 10" 32 Gray Scale VGA Compatible LCD Display, Internal 1.44Mb Floppy Disk Drive, Complete w/ Carrying Case & Charger.

MICRONICS COMPUTERS INC VESA Local Bus



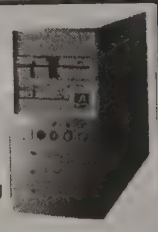
Made In The U.S.A.

486DX2-66	$2299
486DX2-50	$2099
486DX-33	$2049
486SX-33	$1829
486SX-25	$1739

** SX-33 & SX-25 Systems have *No* Cache Memory

Systems Include:
- MX-30 486VLB w/256K Cache, ZIF Socket & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb
- 32-Bit VLB IDE Hdd Fdd Controller
- 420Mb IDE Hdd
- Hercules Dynamite VLB 2Mb Accelerator
- MAG DX-15F 15" SVGA FST Monitor
- 2Ser, 1Par, 1Game
- CS230 Mid-Vertical Case w/250W. P.S.
- 101 Key Keyboard
- Includes DOS

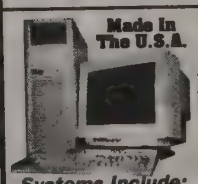
ACER A-Open VESA Local Bus



486DX2-66	$1519
486DX2-50	$1409
486DX-40	$1429
486DX-33	$1449
486SX-33	$1289
486SX-25	$1259

Systems Include:
- ACER A-Open 486 VLB w/ 256K Cache, ZIF Sckt & CPU
- 4Mb Ram
- 1.2Mb & 1.44Mb
- 32-Bit VLB IDE Hdd Controller
- 340Mb IDE Hdd
- Acer CL5428 VLB 1Mb SVGA Accelerator Card
- AcerView 34T 14" 1024x768NI Mon.
- 2Ser, 1Par, 1Game
- Acer A-Open Case w/200Watt P.S.
- 101 Key Keyboard
- Includes DOS

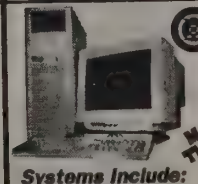
Made In The U.S.A. American Megatrends PENTIUM PCI Bus



$3799

Systems Include:
- AMI Pentium PCI Mbd & Intel Pentium 60Mhz CPU w/256K Cache & 8Mb RAM
- 1.2Mb & 1.44Mb Floppy Drives
- Q-Logic PCI SCSI-2 Hdd/Fdd Controller
- 540Mb FAST SCSI-2 Hard Disk Drive
- Diamond Viper PCI Graphics Accelerator Card (Super Fast! Over 80 Million Winmarks)
- CS-300 Full-Vertical Case w/300Watt P.S. and 2 Super Cooling Fans
- 101 Key Enhanced Keyboard
- Includes DOS. *Monitor not included*

MICRONICS COMPUTERS INC PENTIUM PCI



Made In The U.S.A.

$3599

Systems Include:
- Micronics Pentium PCI Mbd & Intel Pentium 60Mhz CPU w/256K Cache & 8Mb RAM
- 1.2Mb & 1.44Mb Floppy Drives
- Q-Logic PCI SCSI-2 Hdd/Fdd Controller
- 540Mb FAST SCSI-2 Hard Disk Drive
- Diamond Viper PCI Graphics Accelerator Card (Super Fast! Over 80 Million Winmarks)
- CS-300 Full-Vertical Case w/300Watt P.S. and 2 Super Cooling Fans
- 101 Key Enhanced Keyboard
- Includes DOS. *Monitor not included*

On Everything We Carry!

Monitors

AMDEK 432N 14" MonoVGA (Amber/White) **$125**

CTX

5439A 14" SVGA (1024x768,.39dp) **$210**
5468A 14" SVGA (1024x768,.28dp) **$249**
1451 14" Full -Screen NI (1024x768,.28dp) .. **$265**
1461LR 14" NI (1024x768, 72Hz refresh) **$295**
1560LR 15" Digital NI (1024x768,.28dp) **$370**
1760DF 17" Digital NI (1280x1024,.28dp) **$645**
1760LR 17" Digital NI (1280x1024,.28dp) **$675**

Infinity

IT1400VG 14" Mono VGA (Paper White) **$99**
IE1439SV 14" SVGA (1024x768,.39dp) **$195**
IK1439SV 14" Full SVGA (1024x768,.39dp) .. **$205**
IE1428SV 14" SVGA (1024x768,.28dp) **$230**
IK1428SV 14" Full SVGA (1024x768,.28dp) .. **$239**
IE1428N4 14" Full SVGA NI (1024x768,.28dp) .. **$245**
IK1428N4 14" Full SVGA NI (1024x768,.28dp) .. **$255**
IS1528N5 15" FST SVGA NI (1024x768,.28dp) . **$325**
IK1528DN6 15" Digital FST (1280x1024,.28dp) **$385**
IE1728N6 17" FST SVGA NI (1280x1024,.28) ... **$625**
IK1726DN7 17" Digital FST (1600x1200,.26dp) **$685**

Digiview

HR-1401 14" SVGA (1024x768,.39dp) **$189**
HR-1428 14" SVGA (1024x768,.28dp) **$213**
HR-1431 14" SVGA NI (1024x768,.28dp) **$239**

MAG

LX-1450 14" SVGA NI (1024x768,.28dp) **$289**
LX-1564 15" SVGA NI (1280x1024,.28dp) **$369**
MX-15F 15" Digital NI (1280x1024,.28dp) **$459**
MX-17F 17" Digital NI (1280x1024,.28dp) **$859**
DX-15F 15" Green FST (1280x1024,.28dp) **$429**
DX-17F 17" Green FST (1280x1024,.28dp) **$749**

NEC

3V 15" Multi-Freq **Green EPA** (.28dp) **$495**
3FGe 15" Color Monitor (1024x768,.28dp) **$595**
4FGe 15" Multi-Freq (1024x768,.28dp) **$655**
5FGe 17" Multi-Freq (1024x768,.28dp) **$1045**
MultiSync 5FGP 17" (1280x1024,.28dp) **$1175**
MultiSync 6FGP 21" (1280x1024,.28dp) **$2125**

OPTIQUEST

800S 14" VGA (640x480,.39dp) **$205**
900S 14" SuperVGA (1024x768,.28dp) **$250**
1000S 14" SVGA NI (1024x768,.28dp) **$275**
1500D 14" Digital NI (1024x768,.28dp) **$339**
2000DX 15" Digital NI (1280x1024,.28dp) **$375**
2000DC 15" Digital NI (1280x1024,.28dp) **$415**
4000DS 17" Digital NI (1280x1024,.28dp) ... **$690**
4000DC 17" Digital NI (1280x1024,.28dp) ... **$765**

NOKIA
CONSUMER ELECTRONICS

44BS 14" Green SVGA NI (1024x768,.28dp) **$425**
449E 15" Green SVGA NI (1024x768,.28dp) **$545**
447B 17" Green SVGA NI (1280x1024,.26dp) . **$1025**
445M 21" Green SVGA NI (1280x1024,.26dp) . **$2075**

ViewSonic

4E 14" SuperVGA (1024x768,.28dp) **$273**
6E 14" SuperVGA NI (1024x768,.28dp) **$296**
7E 17" SuperVGA NI (1024x768,.28dp) **$739**
14E 14" SuperVGA NI (1024x768,70Hz,.28dp) ... **$325**
15E 15" Flat Screen (.28dp,76Hz refresh) **$375**

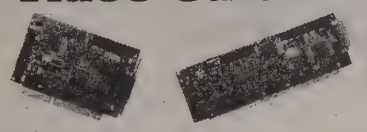
ViewSonic Monitors Continued

15 15" Digital Multi-Freq (.28dp,1280x1024) **$449**
17G 17" Digital Multi-Freq (.28dp,1280x1024) **$769**
17 17" Digital Multi-Freq (.28dp,1600x1280) **$949**
20 20" Digital Multi-Freq (.28dp,1600x1280) **$1499**
21 21" Digital Multi-Freq (.28dp,1600x1280) **$1729**

Sceptre

CM-6Y 14" SVGA (.28dp,1024x768) **$239**
CE-6N 14" SVGA NI Digital (.28dp,1024x768) **$275**
CC-615 15" Flat Screen (.28dp,1280x1024) **$335**
CC-615GL 15" Green FST (.28dp,1280x1024) **$399**
CC-617 17" Flat Screen (.26dp,1280x1024) **$699**
CC-617L 17" FST Low Rad. (.26dp,1280x1024) ... **$749**

Video Cards



Mono/Graphics/Printer Card **$14**
AVGA-1 VGA Card w/256K **$27**
AVGA-3 (CL GD5422) 1MB Accelerator (16.7mil color) .. **$70**
Cirrus Logic GD5424 VLB Accelerator w/1MB **$82**
Cirrus Logic GD5426 VLB Accelerator w/1MB **$90**
Cirrus Logic GD5428 VLB Accelerator w/1MB **$92**
TVGA-9000 VGA w/256K (up to 512K) **$32**
TVGA-8900D 1MB SuperVGA Card (2x faster than) **$64**
TVGA-9200 VESA VLB 1Mb Accelerator Card **$78**
TVGA-9400 VESA VLB 1Mb Accelerator Card **$90**
WD-90C33 **VLB Accelerator** w/1MB **$102**
Paradise VL Plus **Accelerator** w/1MB **$132**
Tseng Lab W32i **VLB** 1Mb Accelerator Card **$146**

ATi

Graphics Ultra+ VLB mach32 w/1MB Dram **$249**
Graphics Ultra+ (1280x1024, 2MB Dram) **$249**
Graphics Ultra Pro (1280x1024 NI, 2MB VRam) **$349**
Graphics Ultra Pro EISA w/2MB VRAM **$455**
VLB mach32 Graphics Ultra Pro w/2MB VRam **$380**
Graphics Ultra PCI w/1MB **$255**

DIAMOND

SpeedStar Pro Graphics Accelerator w/1MB **$112**
SpeedStar Pro VLB Accelerator w/1MB **$112**
Stealth-24 ISA Windows Accelerator w/1MB **$168**
Stealth-24 VLB Windows Accelerator w/1MB **$160**
Stealth Pro Graphics Accelerator w/1MB VRam ... **$260**
Stealth Pro VLB Accelerator w/1MB VRam **$260**
Viper VLB Graphics Accelerator w/2MB VRam **$370**
BRAND NEW!! Stealth 32 PCI w/2MB **$255**
BRAND NEW !! VIPER *PCI w/2Mb VRAM* **$445**

ORCHID

Fahrenheit **Windows Accelerator** w/1MB **$150**
Fahrenheit **VLB Windows Accelerator** w/1MB ... **$150**
BRAND NEW!! Orchid KELVIN 64 VLB **$190**
BRAND NEW!! Orchid KELVIN 64 PCI **$205**

Controllers

High Speed AT I/O (2 Ser. 1 Par.) 16c550 Clone **$35**
AT Super IDE IO Adapter (Fdd/Hdd, 2S, 1P, 1G) **$16**
VESA Local Bus Super IDE & IO (2S,1P,1G) **$30**
PCI Local Bus Super IDE Adapter **$38**
BOCA I/O - 4 Serial & 2 Parallel ports **$95**
GSI-11V **2.88M** Four **(4)** Floppy Controller & Cable **$55**
GSI-18V **Co-resident IDE** Controller **$42**
GSI-21V **2.88M** Four **(4)** Fdd & IDE Adapter **$62**
GSI-32V **2.88M** Four **(4)** Fdd & IDE & I/O **$118**

Promise

DC-200 ISA IDE Caching (OK, upto 16MB) **$100**
DC-2040 ISA SCSI Caching (OK, upto 16MB) **$265**
DC-4030VL VLB IDE Caching (OK, upto 16MB) **$145**
DC-420 VLB IDE Caching (512K, upto 1MB) **$150**

Tekram DC-600B ISA IDE Caching (up to 16MB) **$110**
Tekram DC-680 VLB IDE Caching (up to 16MB) **$145**

Please call for any products not listed in this add.

Controllers

Bus Logic KT445S VLB SCSI Controller Kit **$275**
Bus Logic KT545S ISA FAST SCSI-2 Kit **$235**
Bus Logic KT747S EISA FAST SCSI-2 Kit **$355**

DTC-2278 VLB IDE FDD/HDD Controller **$38**
DTC-2290 **EISA** IDE Floppy/Hard Disk **$118**
DTC-3270VL VLB SCSI-2 Controller **$130**
DTC-3290 **EISA** SCSI **Caching** FD/HD (OK,to 4MB) .. **$435**
DTC-3292 **EISA** SCSI FD/HD Controller **$325**

UltraStor 14FA SCSI FD/HD Controller **$210**
UltraStor 14FA SCSI FD/HD Controller Kit **$250**
UltraStor 24F **EISA** SCSI FD/HD Controller **$370**
UltraStor 24F **EISA** SCSI FD/HD Controller Kit .. **$410**
UltraStor 34F **VESA Local Bus** SCSI FD/HD **$285**
UltraStor 34F **VESA Local Bus** SCSI FD/HD Kit **$325**

Future Domain 1680SVP 16-bit SCSI Fdd/Hdd Kit . **$145**

Adaptec

AHA-1522 SCSI Controller (Card Only) **$89**
AHA-1542C SCSI Bus Mastering (Card only) **$205**
AHA-1542CK SCSI Bus Master Host Adapter Kit **$257**
AHA-1542CK + SCSI Bus Master Host Adapter Kit .. **$320**
AHA-2742AK **EISA** SCSI Bus Master Adapter Kit **$370**
AHA-2842AK **VLB** SCSI Bus Master Kit **$305**

Drives

TEAC 1.2MB FDD (5.25") **$52**
TEAC 1.44MB FDD (3.5") **$42**
TEAC 2-in-1 1.2/1.44MB FDD **$115**
Mitsumi 1.2MB FDD (5.25") **$44**
Mitsumi 1.44MB FDD (3.5") **$33**

CONNER
The Storage Answer.

CP-30174E 170MB IDE HDD (17ms) **$205**
CP-30170E 170MB SCSI HDD (17ms) **$230**
CPS-210A 210MB IDE HDD (14ms,) **$228**
CP-30254H 250MB IDE HDD (14ms) **$245**
CPA-340A 340MB IDE HDD (14ms) **$285**
CPA-420A 420MB IDE HDD (14ms) **$310**
CPA-540A 540MB IDE HDD (12ms,256K cache) ... **$445**
CP-30540 545MB Fast SCSI-2 HDD (12ms) **$570**
CP-1060S 1.06Gb Fast SCSI-2 HDD (9ms) **$830**
CP-31370 1.37Gb Fast SCSI-2 HDD (10ms) **$1070**

FUJITSU

M2624T 520MB IDE HDD (12ms, 5yr warranty) **$485**
M2624FA 520MB SCSI HDD (12ms, 5yr wrnty) **$535**
M2694SA 1.05GB SCSI HDD (10.5ms,5yr wrnty) . **$855**

Maxtor®

Maxtor MX-7245A 245MB IDE HDD (14ms) **$255**
Maxtor MX-7245S 245MB SCSI HDD (14ms) ... **$275**
Maxtor MX-7345A 345MB IDE HDD (14ms) **$295**
Maxtor MX-7345S 345MB SCSI HDD (14ms) ... **$365**
Maxtor MX-540A 540MB IDE HDD (8.5ms) **$435**

Drives Continued

Quantum™

Brand New! ProDrive 270Mb & 340Mb IDE
ProDrive ELS 170MB IDE HDD (17ms, 2yr wrnty) .. **$190**
ProDrive LPS 240MB IDE HDD (15ms, 256K) **$245**
ProDrive LPS 270MB IDE HDD (13ms, 128K) **$250**
ProDrive LPS 342MB IDE HDD (13ms, 128K) **$290**
ProDrive LPS 541Mb IDE HDD (13ms, 128K) **$450**
ProDrive LPS 340Mb SCSI2 HDD (13ms,128K) ... **$355**
ProDrive 1080S 1080MB SCSI-2 HDD (5yr wrnty) . **$840**
ProDrive 1225S 1225MB SCSI-2 HDD (5yr wrnty) . **$945**
ProDrive 1800S 1.8GB SCSI-2 HDD (5ry wrnty) **$1150**

WESTERN DIGITAL

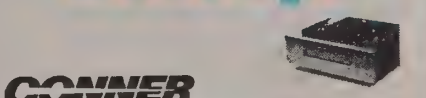
Western Digital AC1210 210MB IDE HDD (13ms) . **$220**
Western Digital AC2250 250MB IDE HDD (13ms) . **$250**
Western Digital AC2340 340MB IDE HDD (13ms) . **$285**
Western Digital AC2420 420MB IDE HDD (13ms) **$310**
Brand New! WD AC2540 540Mb IDE HDD **$420**

****** Please call for Micropolis, Seagate, & Toshiba Hard Disk Drives prices***

SyQuest

SQ5110C 88MB SCSI Removable Disk Drive ..... **$320.**
SQ3105 105MB SCSI Removable Disk Drive (3.5") **$425.**
Mitac 105MB IDE Int. Removable Disk Kit ..... **$320.**
Mitac 105MB IDE EXT. Removable Disk Kit ..... **$410.**
SQ3105 105MB IDE Int. Removable Disk Kit ..... **$350.**
SQ3105 105MB Ext. IDE Removable Disk Drive ..... **$430.**
SQ400 44MB Cartridge ..... **$75.**
SyQuest SQ800 88MB Cartridge ..... **$108.**
SyQuest SQ310 105MB 3.5" Cartridge ..... **$72.**

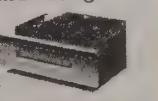
Tape Backups



CONNER
The Storage Answer.

Conner TapeStor 250MB Tape Backup w/One Pre-formatted Cartridge ..... **$159.**
Conner TapeStor 250MB **External Parallel Port** Tape Backup w/One Pre-formatted Cartridge .... **$335.**

COLORADO MEMORY SYSTEMS INC.



Colorado JT-10 120MB **Parallel Port** External .. **$225.**
Colorado JT-20 250MB **Parallel Port** External .. **$349.**
Colorado DJ-10 120MB Internal Tape Backup .. **$109.**
Colorado DJ-20 250MB Internal Tape Backup .. **$179.**
Colorado AB-11 External Adapter Kit ..... **$32.**
Colorado KE-09 External Drive Kit ..... **$69.**
Colorado FC-10 500Kb/s-1Mb/s Adapter Kit ..... **$70.**
Colorado TC-15 Data Compression Adapter Kit **$149.**
Colorado Int. Power Tape 2.0GB Tape Backup .. **$985.**
Colorado Int. Power Tape 4.0GB Tape Backup .. **$1480.**
Colorado Ext. Power Tape 2.0GB Tape Backup . **$1125.**
Colorado Ext. Power Tape 4.0GB Tape Backup . **$1620.**

ESSENCE

ESSENCE GROUP

Fountain Valley Order Hotline (714) 546-3110
FAX (714) 546-3803
17815 Newhope St. #G
Fountain Valley, CA 92708

IRVINE Order Hotline (714) 580-6990
FAX (714) 580-6996
6 Morgan St. Suite #130
Irvine, CA 92718

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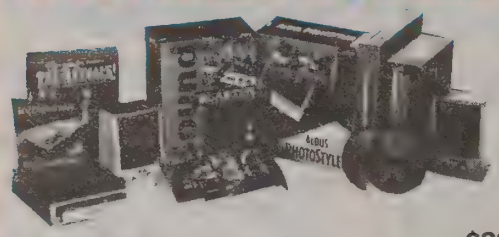
Multi-Media Systems



Harmony IIIC Multimedia Power Kit **$320**
- Mitsumi FX-001D Int. Double Speed CD-ROM 250ms
- Harmony 16Bit Stereo Sound Card, Pair of Speakers
- 5 CD titles - Reference Library, US Atlas, World Atlas, Mavis Beacon's Typing, & Chessmaster 3000

Harmony IIIB Multimedia Power Kit **$395**
- Mitsumi FX-001D Int. Double Speed CD-ROM 250ms
- Sound Blaster 16MCD 16-Bit Stereo Sound Card
- 6 CD titles - MPC Encyclopedia, US Atlas, World Atlas, Mavis Beacon's Typing, & Chessmaster 3000, Return to Zork
- A Microphone & a pair of Mini Speakers

Harmony IIIA Multimedia Kit **$420**
- Panasonic CR-562B Internal Double-spin, Multi-session CD-ROM - 320ms, 300kb/s Data transfer rate
- Sound Blaster 16 Stereo Sound Card - 16bit Sound
- 7 CD titles - MPC Encyclopedia, US Atlas, World Atlas, King's Quest V, Mixed Up Mother Goose, Tempra Photo CD, & Sherlock Holmes Consulting Detective
- A Microphone & a pair of Mini Speakers

Harmony IV Multimedia Power Kit **$625**
- Toshiba 3401B Int. SCSI CD-ROM 320k, 200ms,
- Sound Blaster 16 SCSI-2 16Bit Stereo Sound Card
- 7 CD titles - MPC Encyclopedia, US Atlas, World Atlas, Secret Weapons of the Luftwaffe, Loom, Tempra Photo CD, Reference Library

Harmony IVA Multimedia Power Kit **$670**
- NEC 3XI Internal 3X Speed CD-ROM (195ms,450K)
- Sound Blaster 16 SCSI-2 16Bit Stereo Sound Card
- 7 CD titles - MPC Encyclopedia, US Atlas, World Atlas, Return To Zork, Loom, Kodak Photo CD, Reference Library

MITAC

Mitac Multimedia Deluxe Upgrade Kit **$365**
- Mitsumi Internal FX001D CD-ROM (250ms, Kodak Photo CD compatible, Double Speed 300k Transfer)
- Sound Galaxy 16 DSP PRO Sound Card
- Shielded Stereo Computer Speakers
- Software bundled: Compton's Multimedia Encyclopedia for Windows, The KGB/CIA World Factbook, Dictionary of the Living World, Mayo Clinic, Dinosaurs

CREATIVE
CREATIVE LABS, INC.

Discovery CD 16 Upgrade Kit (Internal) **$445**
- **Sound Blaster 16** Stereo Sound Card
- Creative Labs Internal CD-ROM (Panasonics CD-ROM), 64KB Buffer, 300KB/sec Data Transfer, 320ms Access rate, Photo CD compatible
- A pairs of Stereo Speakers
- Software bundled: Multimedia Encyclopedia, The ... Animals!, Aldus PhotoStyler SE, Just Grandma & Me, Where in the World is Carmen Sandiego - Deluxe

Edutainment CD 16 Upgrade Kit (Internal) **$505**
- **Sound Blaster 16** Stereo Sound Card
- Creative Labs Internal CD-ROM (Panasonics CD-ROM), 64KB Buffer, 300KB/sec Data Transfer, 320ms Access rate, Photo CD compatible
- A pairs of Stereo Speakers
- Software bundled: Multimedia Enclopedia, The Secret of Monkey Island, Loom, Secret Weapons of the Luftwaffe, Sherlock Holmes - Consulting Detective Aldus PhotoStyler SE, Indianapolis 500, Lemmings

Sony / Sound Blaster 16 Bundle **$299**
- **SONY CDU-33A** Internal CD-ROM (300k,280ms)
- **Sound Blaster 16** Stereo Sound Card

NEC / Sound Blaster 16 SCSI2 Bundle **$345**
- **NEC CDR-210** SCSI Int. CD-ROM (320ms,300k)
- **Sound Blaster 16 SCSI-2** Stereo Sound Card

Toshiba / Spectrum Bundle **$470**
- Toshiba 3401B Internal SCSI CD-ROM (300Kb/s, 200ms)
- Media Vision Pro Audio Spectrum 16 Stereo Sound Card

Sony / Spectrum Bundle **$299**
- Sony 33A 2X Internal SCSI CD-ROM (300Kb/s, 320ms)
- Media Vision Pro Audio Spectrum 16 Stereo Sound Card

CD-ROMs

Mitsumi FX001D Int. CD-ROM (Double Speed,250ms) **$180**

NEC

NEC CDR-210 Int. OEM SCSI CD-ROM (320ms,300k,) .. **$180**
NEC CDR-55 Int. OEM SCSI CD-ROM (350ms,300k,) **$219**
NEC CDR-74J-1 External SCSI CD-ROM (280ms) **$439**
NEC CDR-510 Int. 3X Speed CD-ROM (195ms,450K) ... **$385**
NEC 3XI Internal 3X Speed CD-ROM (195ms,450K) **$515**
NEC 3XE External 3X Speed CD-ROM (195ms,450K).... **$605**
NEC 3XP Portable 3X Speed CD-ROM (220ms,380K) ... **$485**

Panasonic Office Automation

Panasonic CR-562 Int. CD-ROM (Double spin) **$170**
Panasonic CR-5632Int. CD-ROM (Double spin) w/Interface ... **$190**

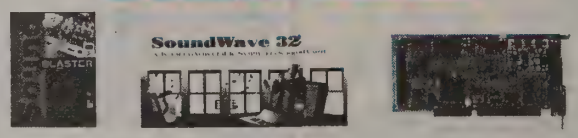
SONY.

SONY CDU-33A Internal CD-ROM (300k,280ms) **$170**
SONY CDU-33A Internal CD-ROM w/Interface **$190**

TOSHIBA

Toshiba 4101B Int. SCSI CD-ROM 320k, 275ms **$275**
Toshiba 3401B Int. SCSI CD-ROM 320k, 200ms **$345**
Toshiba 3401B Int. SCSI CD-ROM 320K, 200ms **$379**
Toshiba 3401E Ext. SCSI CD-ROM 320K, 200ms **$509**

Sound Cards



CREATIVE
CREATIVE LABS, INC.

Creative Lab Sound Blaster Deluxe **$72**
Creative Lab Sound Blaster Pro Deluxe **$98**
Creative Lab Sound Blaster 16 Basic **$138**
Creative Lab Sound Blaster 16 MCD **$168**
Creative Lab Sound Blaster 16 MCD ASP **$198**
Creative Lab Sound Blaster 16 SCSI II **$188**
Creative Lab Sound Blaster 16 SCSI II ASP **$208**
Creative Lab Video Blaster w/Microsoft video for Win ... **$355**
Creative Lab Video Spigot video capture card **$295**

MEDIA VISION

Media Vision Pro Audio Spectrum 16 Basic **$125**
Media Vision Pro Audio Spectrum 16 Sound Card **$135**
Media Vision Pro Audio Studio 16 Sound Card **$175**
Media Vision Pro Movie Spectrum Video Capture card **$295**

ORCHID

Orchid GameWave 32 (Wavetable DSP) **$135**
Orchid SoundWave 32 (Advanced Wavetable DSP) **$189**

Speakers & Accesories

Creative Labs CT-38 Amplified Stereo Speakers **$26.50**

Labtec.

AM-22 Deluxe Microphone **$13.95**
C-10 Computer Stereo Headphone **$14.95**
CS-150 Shielded Amplified Stereo Speakers **$19.50**
CS-180 Shielded Amplified Stereo Speakers **$18.50**
CS-550 Shielded Amplified Stereo Speakers **$27.50**
SS-700 Shielded Amplified Stereo Speakers w/3 Band EQ .. **$32.50**
CS-800 Shielded Amplified Stereo Speakers w/AC Adapter . **$38.50**
CS-900 Shielded Amplified Stereo Speakers w/AC Adapter . **$65.50**
SS-1000 Shielded Amplified Stereo Speakers **$88.00**
AD-4 400mA AC Adapter (for Speakers System) **$9.95**

CD Titles

To Be Sold w/ Purchase of CD-ROM or Bundle Only.
Most Titles $14. to $27.

BUSINESS

Bus. Phone Book - 1992 (DOS)
Authorware Star (MPC)
Busines & Economy Atlas (DOS)
Kodak Photo CD (MPC)
Lotus 1-2-3 V3.1 (MPC)
Macromind Action (MPC)
Marketing Master 1992 (DOS)
Microsoft Works (MPC)
Publish It 2.0 (DOS)
TEMPRA Access Photo CD Imaging Software (DOS)

EDUCATION

Animals! (MPC)
Annabel's Dreams (MPC)
Arthur's Teacher Trouble (MPC)
Audubon's Mammals (DOS)
Audubon's Birds (DOS)
Barron's College Guide (MPC)
Bring the World Your Senses (DOS)
Carmen San Diego (DOS)
Choose your College
Collection of PC Graphics (DOS)
Composer Quest (MPC)
Compton's Encyclopedia (MPC)
Corp Snapshot (DOS)
Dictionary of the Living World (MPC)
Dinosaur Adventure (MPC)
DTP Pro FM - Wave Clipart
Electronic Home Library (DOS)
Family Choice / Britannica (DOS)
Family Doctor (DOS/MAC)
Family Education Collections (DOS)
Great Cities - Vol. 1 (DOS)
Great Cities - Vol. 2 (DOS)
Jets & Props - Aris (MPC)
Language of the World (Windows)
Library of Future 1st (DOS)
MacMillan Child Dictionary (MPC)
Mavis Beacon TeachesTyping (MPC)
Media Clips-Jets,Props,Place (MPC)
Microsoft BookShelf (MPC)
National Geographic Mammals (DS)
National Parks (DOS)
Ocean Digital Imagery V1 (DOS)
Playing Language - English (DOS)
Playing Language - French (DOS)
Playing Language - Germany (DOS)
Playing Language - Japanese (DOS)
Playing Language - Spanish (DOS)
Presidents (DOS)
Renaissance Master I (MPC)
Renaissance Master II (MPC)
Illustrated Works of Shakespeare
Sleeping Beauty (MPC)
Sound Library (MPC)
Survey of Western Arts (MPC)
TIME Almanac - 1991 (DOS)
Time Table of History (DOS)
Toolworks Encyclopedia (MPC)
Toolworks Reference Library (DOS)
U.S. Atlas & Automap (DOS)
Atlas Pak - US / World Atlas (DOS)
U.S. Histroy (DOS)
USA Wars: Civil War (DOS)
USA Wars: Desert Storm (MPC)
USA Wars: Korea (DOS)
USA Wars: World Wae II (DOS)
USA Wars: Vietnam (DOS)
Vital Signs (MPC)
Whale of Tale
Wild Places (DOS)
WinWare Vol 3
World View (DOS)

ENTERTAINMENT

Amanda Stories (MPC)
Battle Chess (DOS)
Beauty & Beast (MPC)
Beyond the World of Stars (DOS)
CD Game Pak II (DOS)
CD Storytime (DOS)
Chessmaster 3000 (MPC)
CIA World Fact Book (DOS)
Guinness Records 1993 (MPC)
Guinness Disc of Records (DOS)
Interactive Storytime Vol 1 (DOS)
Jones in the Fast Lanes (MPC)
King's Quest V (DOS)
Loom from Lucas Film (DOS)
Mantis Experimental Fighter (DOS)
Mario's Missing/DGeneration
Mario Mission/ World Atlas (DOS)
Mayo Clinic Family Health (DOS)
MIDI Music Shop (MPC)
Mixed up Mother Goose (MPC)
The Secret of Monkey Island (DS)
PC-SIG 11th Edition (DOS)
Peter & the Wolf (MPC)
Secret Weapons of Luftwaffe
Sherlock Holmes (DOS)
So Much Sharewaew I (DOS)
So Much Shareware II (DOS)
Space Adventure (MPC)
Space Quest IV
Sport's Best (3 in 1) (DOS)
Stellar 7 (DOS)
Total Baseball (DOS)
Who Killed Sam Rupert (MPC)
Willie Beamish - The Adventure
Wing Commader/Ultima VI (DOS)
Wizard

CD Pak for Windows **$60**
- **6 Titles:** Multimedia Encyclopedia, The Animals!, Chessmaster 3000, US Atlas, World Atlas, & Beacon Teaches Typing 2.0

CD Quartet 1 ..... **$30**
- US Atlas, World Atlas, Chessmaster 3000, Mavis Beacon Teaches Typing

CD Quartet 2 ..... **$40**
- US Atlas, World Atlas, Reference Labrary, Secret of Monkey Island

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System Boards

SYSTEM BOARDS (w/CPU, 0K Memory) - AMI

AMI Excalibur Pentium **PCI** 60Mhz M/B &CPU w/256K Cache $1855
AMI Excalibur Pentium **VLB** 60Mhz M/B &CPU w/256K Cache $1795

AMI Enterprise IV 486DX2-66MHz **EISA VLB** M/B w/256K Cache ... $1040
AMI Enterprise IV 486DX-50MHz **EISA VLB** M/B w/256K Cache $975
AMI Enterprise IV 486DX-33MHz **EISA VLB** M/B w/256K Cache $805

AMI Super Voyager II 486DX2-66MHz **PCI** M/B w/256K Cache $1200
AMI Super Voyager II 486DX-33MHz **PCI** M/B w/256K Cache $965
AMI Super Voyager II 486DX2-66MHz **VLB** M/B w/256K Cache $910
AMI Super Voyager II 486DX-50MHz **VLB** M/B w/256K Cache $845
AMI Super Voyager II 486DX-33MHz **VLB** M/B w/256K Cache $670
AMI Super Voyager II 486SX-33MHz **VLB** M/B w/256K Cache..... $532
AMI Super Voyager II 486SX-25MHz **VLB** M/B w/64K Cache..... $405

SYSTEM BOARDS (w/CPU, 0K Memory) - IBM (Alaris)

IBM Leopard 486SLC2-50 **VLB** M/B w/64K Cache $290
IBM Leopard 486SLC2-66 **VLB** M/B w/64K Cache $295
**Leopard 486SLC2 M/B has 2 VLB slots, & 16K Internal Cache*
**Manufactur in the U.S.A. by IBM Charlott, NC, w/ 3yr limited warranty*
**128K Cache Upgrade from 64K +$15., Math-Co Upgrade +$45.*

SYSTEM BOARDS (w/CPU, 0K Memory) - MICRONICS

Micronics M5PI Pentium 60Mhz **PCI** M/B & CPU w/256K Cache $1655

Micronics EV 486DX2-66MHz **EISA VLB** M/B w/256K Cache $1125
Micronics EV 486DX-33MHz **EISA VLB** M/B w/256K Cache $865

Micronics E3 486DX2-66MHz **EISA** M/B w/256K Cache $1025
Micronics E3 486DX-50MHz **EISA** M/B w/256K Cache $990
Micronics E3 486DX-33MHz **EISA** M/B w/256K Cache $760

Micronics MX-30 486DX2-66MHz **VLB** M/B w/256K Cache $900
Micronics MX-30 486DX2-50MHz **VLB** M/B w/256K Cache $750
Micronics MX-30 486DX-33MHz **VLB** M/B w/256K Cache $640
Micronics MX-30 486SX-25MHz **VLB** M/B w/0K Cache $305

Micronics Mini 486DX2-66MHz M/B w/256K Cache w/IO $920
Micronics Mini 486DX-50MHz M/B w/256K Cache w/IO $852
Micronics Mini 486DX2-50MHz M/B w/256K Cache w/IO $682
Micronics Mini 486DX-33MHz M/B w/256K Cache w/IO $615
Micronics Mini 486SX-25MHz M/B w/0K Cache w/IO $283

SYSTEM BOARDS (w/o CPU, 0K Memory) - EISA

AIR Baby 486 **EISA VLB** M/B w/256K Cache (72pin Memory) $385
AIR Baby 486 **EISA VLB** M/B w/256K Cache (30pin Memory) $395
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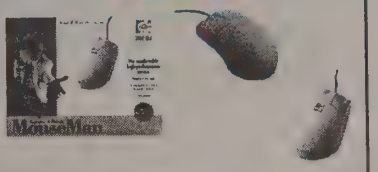

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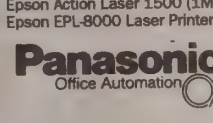

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Continued from page 140

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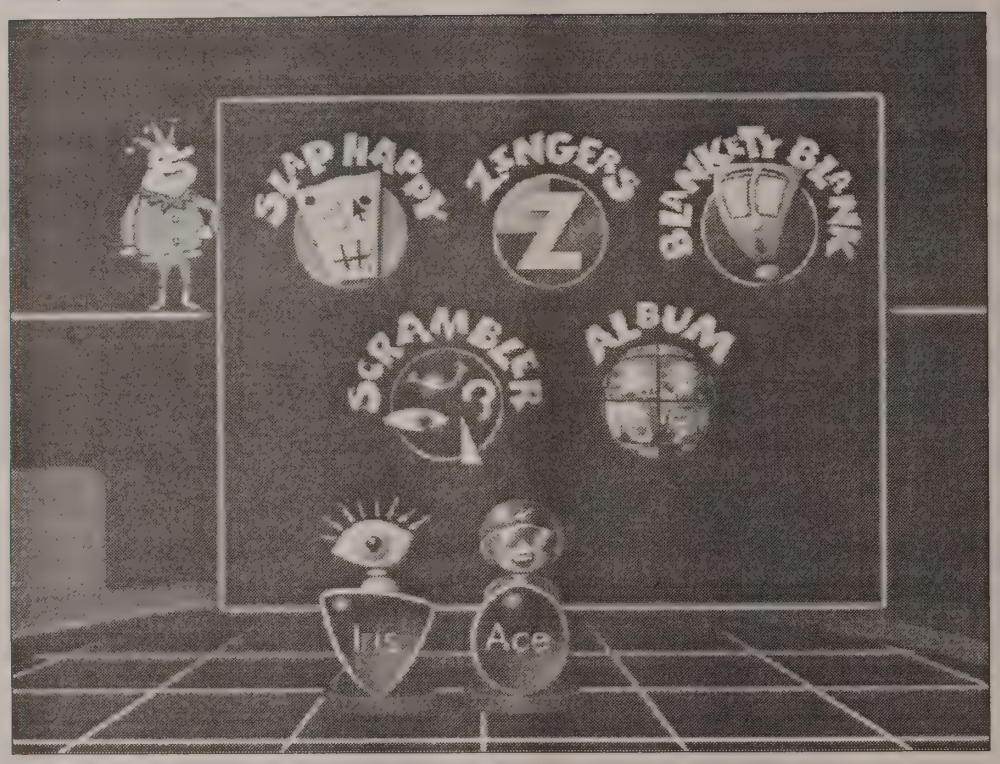

age group interaction. We designed them in such a way that we wouldn't have to redesign them when interactive TV comes of age, when decent players capable of playing CDs come in large quantities to people's TV sets. We wanted to be sure to be able to port our software over without having to redesign it. We've been very market driven in that we brought hundreds, *hundreds*, of families and TV households through this shop. Every two months we'd get another batch of fifty or sixty people. We've been doing this constantly for the past three years.

"That's gotten us to get really in touch with our customers. We've been careful to not select heavy computer users, but rather ordinary folks who've got a life to live and who only have so much time in their lives to try some of these new things, whose expectations are different from computer users'. We've taken those expectations as well as their reactions to our products and we've turned them into something we think is friendly enough and easy enough and attractive enough that people will want to take those precious minutes out of their daily lives and enjoy what we've got to offer.

"The feeling is that the computer screen is not the be-all and end-all, but it's merely a catalyst for engaging people to do things together. It's to bring people together through technology."

"The first two titles then are family games, they're aimed at multiple players with different levels so that the parent and a child can sit down together and both can have a good time. The parent won't get bored to tears like they are by Nintendo games. The kids will have a good time and won't feel like it's the parent forcing some education on them. Both age groups are having a good time, there's a lot of social interaction in the room, eye contact, laughter, wisecracks, people sort of elbowing each other. The feeling is that the computer screen is not the be-all and end-all, but it's merely a catalyst for engaging people to do things together. It's to bring people together through technology—that was a very important goal, for which I think parents are going to reward us, families are going to reward us.

"Already, when we ask folks 'What do you think this is worth?' they're saying, 'Whatever Nintendo costs, and given that you've shown me that it's also good for my kid, I'd even pay an extra ten bucks, twenty bucks for it.'"

WHAT MAKES GOOD MULTIMEDIA—THE ESSENTIAL INGREDIENT

This user testing has provided Florin with the essential ingredient for a satisfactory interactive experience. "One of the things we've learned is that people like having an activity that is fairly structured once they open up one of these multimedia things. So the games provide us with a template for what to do with it.

"Essentially you get motivation and feedback. People fall into the experience very naturally when it's a game. When it's an atlas, if you browse, the activity is less compelling. We all thought when we started multimedia that people would be happy to just browse for the rest of their lives. It turns out in reality that browsing is something that's time-consuming that still forces you to sit in front of the screen, which is not always the most enjoyable experience, and that in fact you really need to find a more structured activity to really engage people in a more continuous fashion. The repeat factor is not there on a browsable product as much as it is on something that has a little bit of structure. People enjoy browsing a little bit but they say, 'Okay, I've browsed it,' and that's it. And they put it back on the shelf."

Florin emphasizes that developers of multimedia products should "try to find a fun element that takes advantage of the unique capabilities of the interactive medium to jumble things up and to challenge you to put things back together. It's a wonderful medium for composing and rearranging things. Your typical browser does not allow you to do that. So, at the very least, people should come up with a front end that allows you to do something in a virtual hands-on manner where you can say, 'How about this and this together, how about this and this together?' Unless they provide this kind of front-end, hands-on activity where people are engaged in more than just browsing and reading, I think that unfortunately a pure browsing reference is going to end on the shelf more often than on the screen."

Continued on page 179

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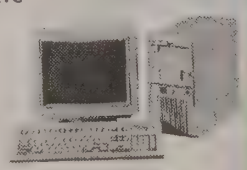

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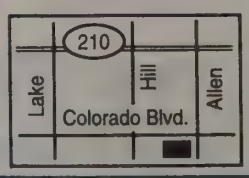

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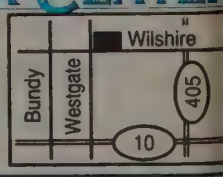

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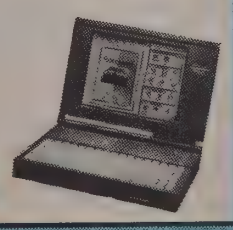

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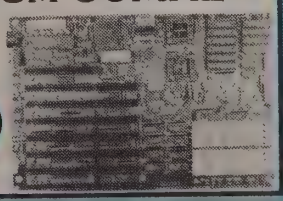

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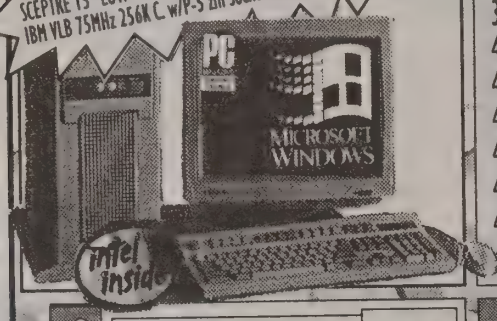

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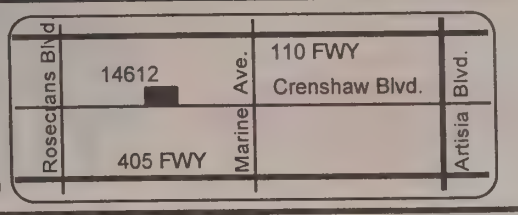

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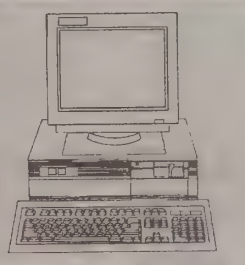

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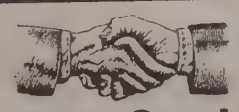

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Multi & Media beyond

Networking The Amiga

AmigaLink Finds New Use For Floppy Disk Port

BY DOUGLAS J. NAKAKIHARA

Now even slotless Amiga models like the A500, A1200, and CDTV can be part of a network. Spectronics International U.S.A. is now shipping a terrific product called AmigaLink that allows Amigas to be networked using the floppy drive port.

Although networking usually involves multiple users, single users can also benefit. Each step in the evolution of the Amiga has meant some incompatibility or another. As a result, many Amiga owners continue to hang on to older machines, even after purchasing a newer model. By networking the Amigas, peripherals can be shared, allowing maximum use of all hardware.

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PARNET

Of course, many Amiga owners already rely on the freely distributable ParNet software to network Amigas. Like ParNet, AmigaLink is also a so-called peer-to-peer network because all of the nodes (i.e., networked computers) are equals, and any one of them can access another's storage devices.

However, as wonderful as ParNet is, it's just a toy compared to AmigaLink. A downside of using ParNet is that only two Amigas can be networked, while AmigaLink can have up to twenty. Furthermore, because ParNet monopolizes the parallel port, it can be a real pain to use other peripherals that require this port, like a printer, scanner, or audio digitizer. ParNet also provides no access security between nodes.

Although twenty is the recommended maximum number of nodes, that number can be exceeded, as can the recommended cable length limit of 330 feet. Apparently, the amount of interference at the network's location determines the actual maximum, but this can only be determined by trial and error. For example, using shorter cabling between nodes may allow you to link more than twenty Amigas.

INSTALLATION

Although the manual provides adequate

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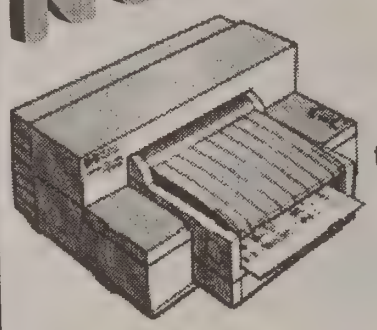

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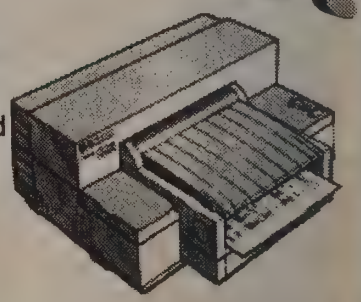

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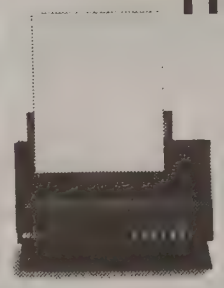

Need something light and compact for printing on the go?! *Think Ahead* to HP's new DeskJet/DeskWriter 310 portable inkjet printer, the best printing companion for your notebook PC or Macintosh PowerBook. It's 3-page-per-minute engine prints in clear, sharp black at 300 dots-per-inch; or print vibrant colors with the optional color kit.

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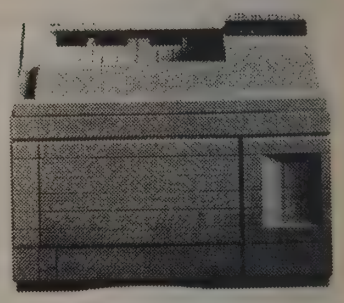

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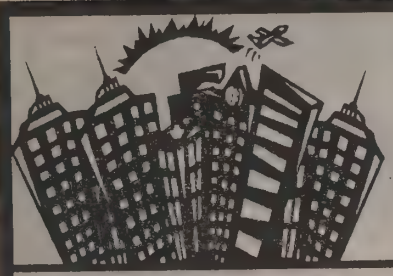

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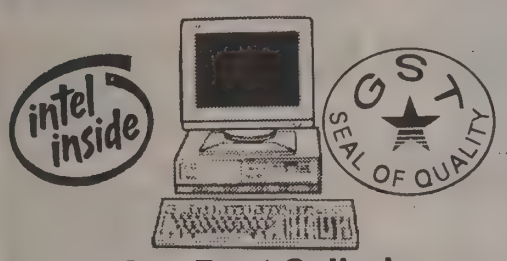

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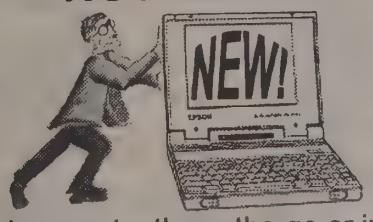

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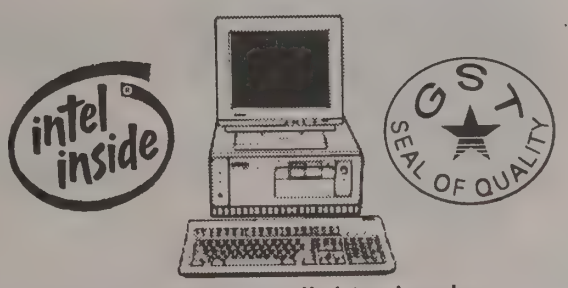

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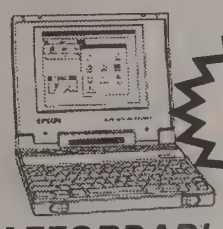

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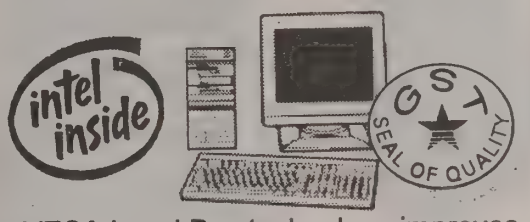

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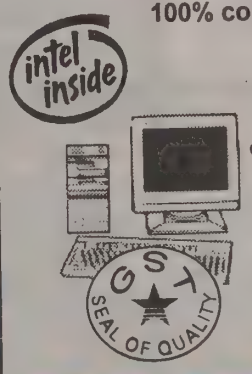

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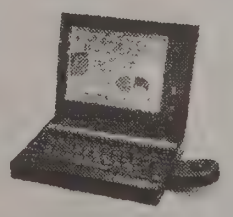

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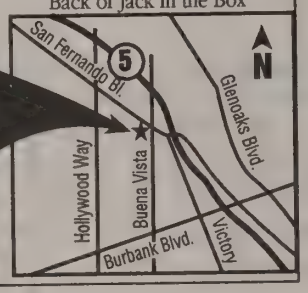

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By networking the Amigas, peripherals can be shared, allowing maximum use of all hardware.

step-by-step instructions, they are spread over several chapters and the process takes longer than it should. Because installation is fairly involved, it would have been much better if the installation steps were consolidated and preceded by a brief overview of the procedures.

In spite of this, I had two nodes up and running in about one-half hour.

To install AmigaLink, you must first physically connect the computers. The petite AmigaLink adapter is basically a 23-pin connector with a BNC T-connector protruding from where a cable would normally exist. A removable terminating cap is attached to one end of the T-connector. AmigaLink will work with pass-through connectors, and you can still have up to three floppy drives on each Amiga.

Each Amiga must have its own adapter; 50-ohm RG-58 coaxial cabling is supplied. By removing the terminating cap, you can daisy-chain multiple computers together; however, there must be a terminating cap on the first and last nodes. The procedure is easy, and you don't even have to open a computer case!

The T-connector portion of the adapter is removable and you can disconnect or reconnect nodes without powering down. Connections will be reestablished once nodes are reattached. However, you should never add or remove an AmigaLink adapter while the computer is running.

The software is installed in three steps. First you must install the device driver on each Amiga. This is accomplished by clicking an icon and following the instructions. The manual provides detailed instructions on what AmigaDOS commands must be available for the installation script to work properly (e.g., Run, NewCLI, Copy, etc.). If the software is being installed on a floppy disk, you must delete some files to make room for the AmigaLink software. A handy list of deletable files is provided for Workbench 1.3 and 3.0 disks. Between the two, you can come up with a list for a 2.x Workbench disk. Obviously, you should use a copy of your original Workbench disk.

The second step is to install the file system software on each computer. Again, this is a click-and-go procedure. During this process you will be asked for a "host" name. Each node must have a unique name, like "Dougs4K," or "CDTV1." I'd recommend that you

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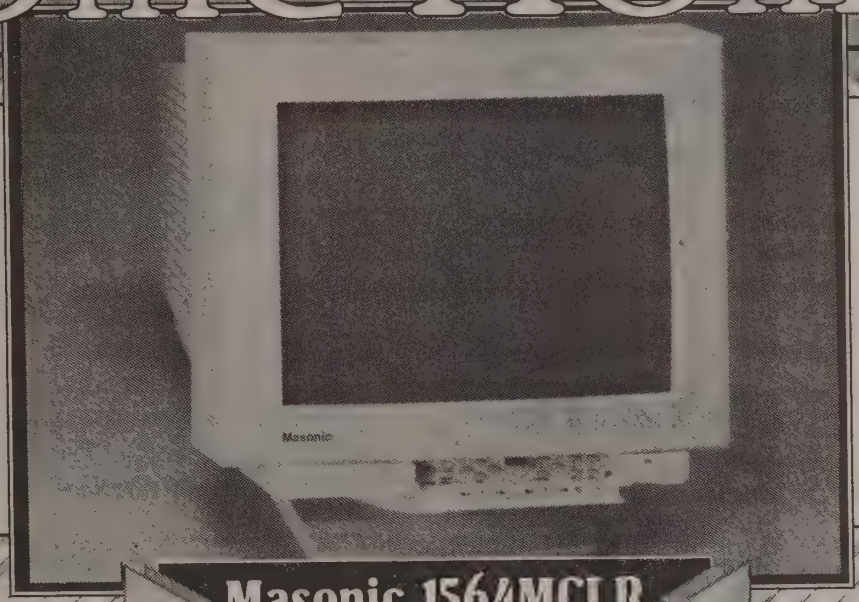

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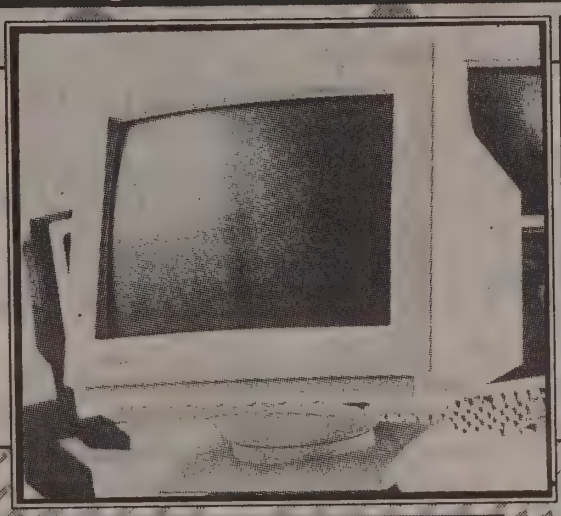

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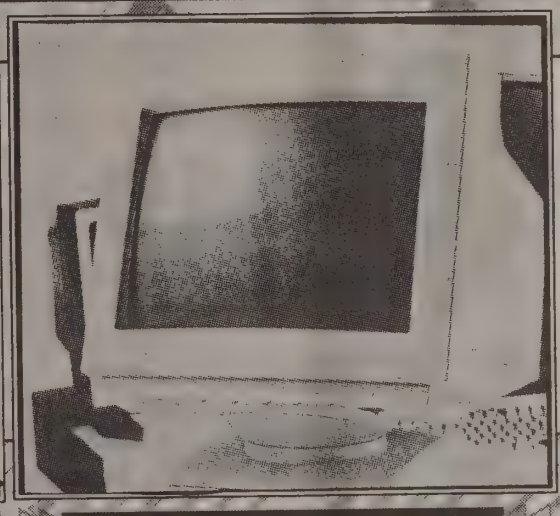

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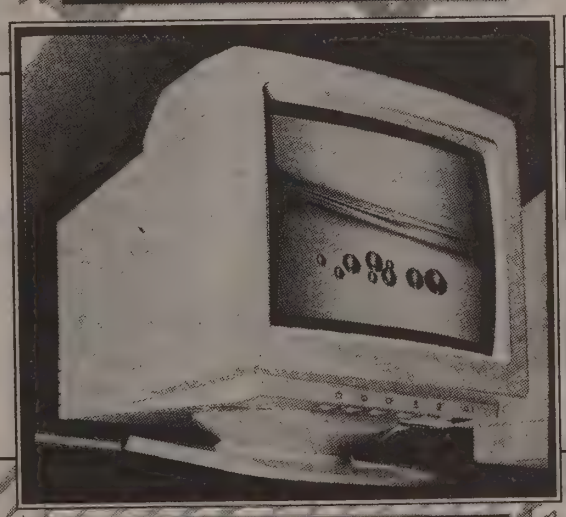

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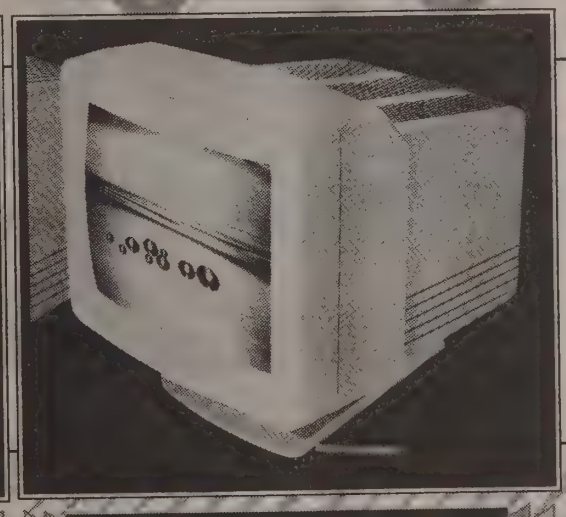

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keep names as short as possible for reasons you'll see later on. (I was surprised to find that the AmigaLink device driver is SANA-II compatible [Standard Amiga Network Architecture]. This means that ENVOY or other SANA-II compatible networking software can be used instead of the AmigaLink file system software.)

Once the device driver and file system are installed on all Amigas, the third step is to run the configuration programs on each node. These programs do not have to be installed on each node and can be run from

Spectronics is also considering releasing software to do simultaneous Lightwave rendering on multiple Amiga/Toaster systems.

the AmigaLink floppy disk. However, I found it more convenient to copy them to my hard drives for possible future configuration changes. There are two configuration programs: Import and Export.

Export allows you to identify which devices are available to other nodes. You can keep certain devices private and not allow remote access. This covers all storage devices including RAM: and removable media, like floppy drives (a disk must be present).

The Export settings can be saved as a default or just used for the current session. The settings file is saved in the ENVARC: directory under Networks. (ENVARC: is a standardized storage area for configuration information.) You can also save multiple settings.

Running the Import program brings up a list of the other nodes on the network, called "hosts." By selecting one of the hosts with the mouse, a list of all of its available (i.e., exported) devices appears. You can then select which devices should be mounted on this particular node. (Normally, the Export program should be run on all nodes before running the Import program.)

To avoid name conflicts, Import automatically appends the name of the host to the front of the device and volume names. (Remember, every Amiga storage device has both a device and volume name, which are usually different.) For example, the device and volume names "HD1" and "Work" on host "A3000" become "A3000-HD1" and "A3000-Work," respectively. So if a node already had a HD1 device called Work, a similarly named device on a remote node could be accessed without conflict. The default names can be changed, however.

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The Import settings are saved in a file in the WBStartup drawer. Although this is a logical location, booting up without all nodes active will yield a slew of annoying error requestors. You can drag the Import icon out of the WBStartup drawer, but you'll have to move it every time new settings are saved. I remedied this by adding some lines to my Startup-Sequence that checks for the Import files in the WBStartup drawer and then moves them to another drawer. This works because the Startup-Sequence is executed before WBStartup programs are run. I don't know why the Import settings aren't saved in the ENVARC: directory just like the Export settings. This would allow the Import startup icon to be placed anywhere.

UTILITIES

Diagnostic utility programs are also supplied. One is a self-testing program which identifies hardware problems. Two other programs test the receiving and sending abilities of computers on the network. The Statistics program monitors and displays network performance information.

AmigaLink comes with a utility program called Spooler, which allows multiple nodes to use the same printer. Spooler is run on the node with the printer, referred to as a "print-server." The program monitors a user-specified directory for activity. When a file is completely "printed" to that directory, Spooler sends it to the printer port, usually PAR:, and then deletes the file.

All other nodes must run the AmigaDOS CMD command, usually found in the Tools or Utilities drawer. Generally, CMD is used to redirect printer output to a file in RAM:. However, the output it intercepts can also be redirected over the network to the monitored Spooler directory. You should be able to set up multiple print-servers, each running its own Spooler. Nodes could then print to any of these servers by simply changing the CMD redirection.

Do not run CMD on the print-server, however. Doing so will create an endless loop: CMD redirects data headed for the parallel port to the Spooler directory, Spooler then sends this back out to the parallel port—you get the idea.

OS1.3

Although AmigaLink was developed for OS2.0+ users, it functions fine using OS1.3 (reportedly even on an Amiga 1000). It's not as automated as under OS2.0+, so you'll have to use some CLI commands. However, you can modify your Startup-Sequence to automate the process. Remember to include the StartServer command, as the installation process does not do it for you.

MY NETWORK

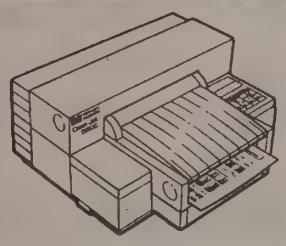
My test network consisted of an Amiga 3000, 4000, and CDTV. The CDTV required using a pass-through external floppy drive. Since many external floppy drives, like the "official" black CDTV ones, do not have a pass-through connector, Spectronics will be releasing an inexpensive T-connector providing pass-through capabilities. An adapter for CD32 is supposedly in the works too. (Note: If you don't have a keyboard for your CDTV, there are a few public domain utility programs that emulate keyboard input using a mouse.)

I was extremely impressed with the AmigaLink. The network is professional and well implemented. Remote devices function just like local ones and their icons appear right on the Workbench, including "left out" icons (OS2.0+)! The network is virtually invisible. Here is where my earlier suggestion for short host names comes into play. Volume names that display wider than their icon will make for a real ugly Workbench! This is not a functional problem, but could become aesthetically annoying.

To network a CDTV, either have no CD inserted or make sure the CD is non-booting, so the unit will boot off the floppy drive. I was happy to find that AmigaLink handled changing the CDs. Although the volume name didn't change, I could still access it. To get the name to change you must unmount and remount the device.

continued on page 185

NEW TECHNOLOGIES



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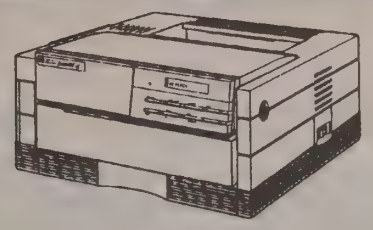

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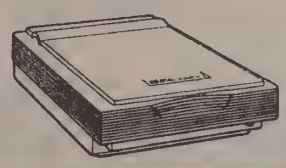

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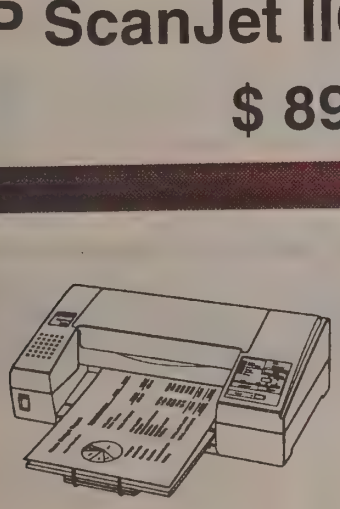

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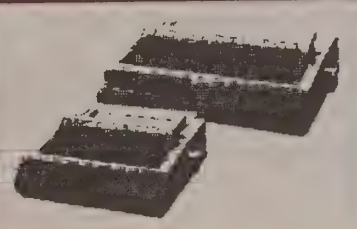

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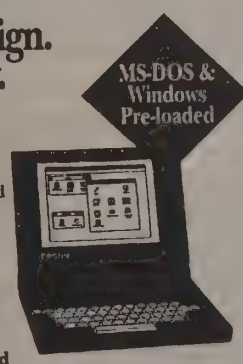

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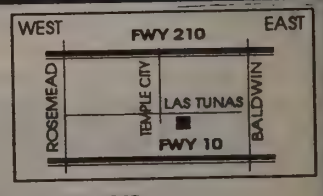

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Release 3 Presents Thoughtful, Practical improvements To An Already Powerful Animation Software Package For The PC

BY PAMELA MASON

Creativity, innovation, invention—the results of combining add-on products with Autodesk 3D Studio.

By itself, Autodesk 3D Studio Release 3 is a powerful animation and rendering package for the PC; but when combined with some of the external products available it can be tailored to meet almost any need. Some of the areas where this union can be seen are in virtual reality applications, forensic animation, industrial design, 3-D visualization, and special effects.

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"We may begin to see reality differently simply because the computer produces knowledge differently from the traditional analytic instruments. It provides a different angle on reality."

—Heinz Pagels, *The Dreams of Reason*, 1988

The ability to create virtual environments on the PC, complete with helmets and datagloves, has arrived. Autodesk was the first company to ship a PC virtual reality software product—the Cyberspace Developer's Kit. Conceived in 1988 in a workspace at Autodesk known as "cyberia,",CDK has since grown into a complete toolset for VR development. Programmers can create geometry or models in 3D Studio and AutoCAD, and combine them with CDK's C++ libraries and their own custom code to design and create any kind of virtual environment they can envision.

CDK has been used to create applications such as walk-throughs of barrier-free designs for the handicapped, and in process-control in manufacturing. Autodesk sees this product as finding many uses in the fields of education and training, and architecture and medicine.

Sense 8's World ToolKit is another PC virtual reality development software library of C routines. After creating a virtual world in 3D Studio with .3DS files (or in another modeling package that outputs .dxf format files), World Toolkit can "read in" and use those files. You could, for example, simulate the effects of two molecules docking, or grab one using your wired glove and dock it yourself! Recently, the astronauts who repaired the Hubble telescope practiced for the real event in a virtual reality environment at NASA's Houston Space Center. They wore helmets to view the image of the space craft and had sensor gloves to sense how the repair work would

continued

RESOURCES:

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(415)491-8853

World Toolkit
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Copyright © 1994 by Pamela Mason. All rights reserved. Pamela Mason has worked at Hewlett-Packard for ten years as a CAD drafter and technical writer, is a consultant to author Robin Williams, and is currently developing animation and multimedia applications.

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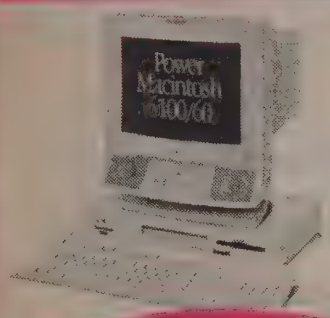

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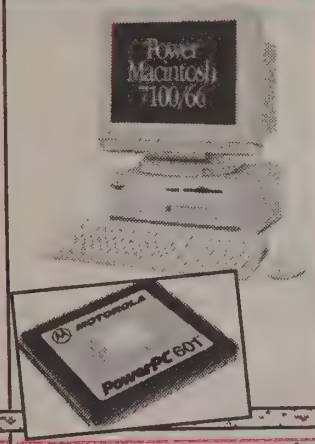

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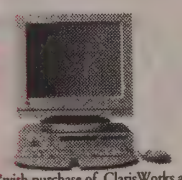

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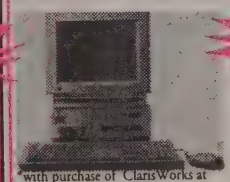

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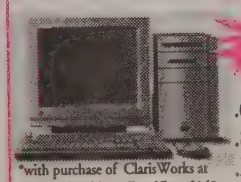

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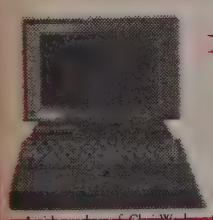

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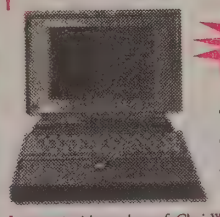

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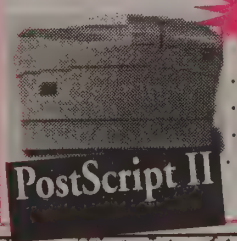

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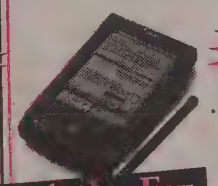

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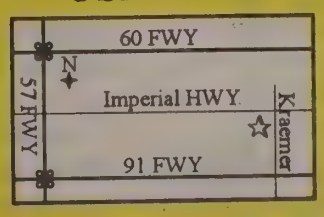

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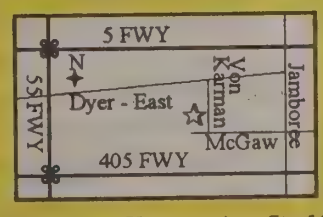

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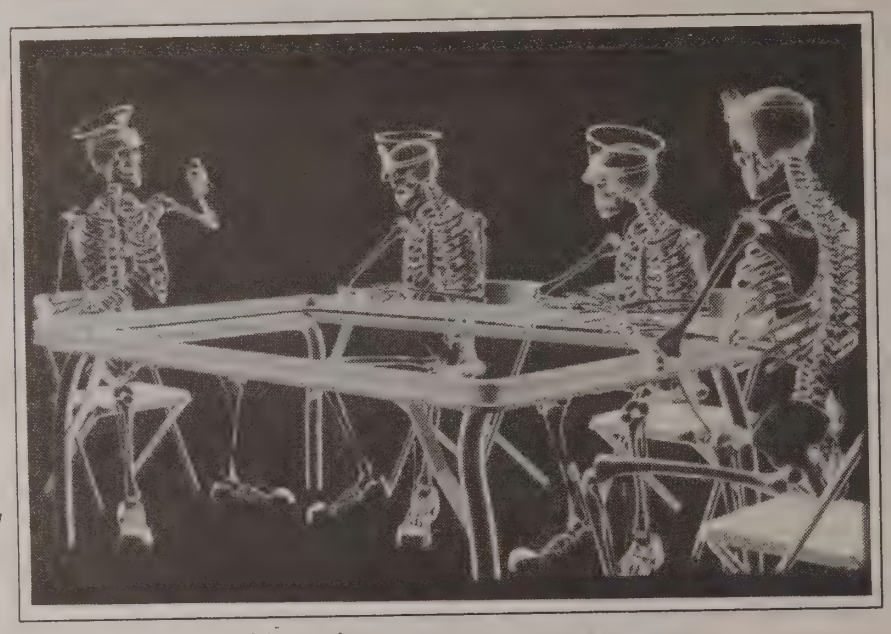
feel in space. Tom Coul, president of Sense 8, says, "World Toolkit for Windows puts a powerful simulation tool in the hands of Window's developers and offers an entirely different approach to the human-machine interface paradigm. As developers use this product, it will spawn new and inventive ways to interact with the computer."



From the movie *Toys* Courtesy Pacific Data Images/Viewpoint Datalabs

THE VIRTUAL STOCK MARKET

Using Sense 8's World Toolkit, Paul Marshall, executive director of Maxus Systems International, developed a software program called Capri. Capri allows an investor to fly above or below a board of color-coded shapes representing stocks, bonds, and other investments to see what they are doing "visually." A grid filled with boxes, looking like square city blocks from the air, has one axis that represents types of investments, and the other showing which stock market those investments are trading on—NY, Tokyo, or Hong Kong, for example. Each box is filled with chips; if a chip is red, it means the stock is down, blue means up, or gray not much change. The chips can be spinning or positioned differently to show various types of activity. You can toggle to printed information to investigate further any stock or investment you choose.

INDUSTRIAL DESIGN

Tom Rzonca (Rzonca Multimedia) is a multimedia developer who works extensively in industrial design. He will either create a model of a product in 3D Studio from scratch, or load an existing CAD file of a product into 3D Studio and then render the file using 3D Studio's powerful renderer, so that the manufacturer can visualize what the finished product will look like.

"3D Studio has reached a level of maturity with Release 3 that's difficult to compare to anything else on the PC platform, or any other platform for that matter," says Rzonca. "With its 64-bit true color rendering and ray-traced shadows, the color is like nothing you've ever seen and the rendering speed has also been greatly improved. It blows Topas out of the water. Release 3 is a complete solution."

> "3D Studio has reached a level of maturity with Release 3 that's difficult to compare to anything else on the PC platform, or any other platform for that matter."
>
> —Tom Rzonca, Rzonca Multimedia

Rzonca is also currently developing a VR, product-prototyping application, using Autodesk's Cyberspace Developer's Kit combined with images created in 3D Studio, that "simulates" physical properties such as strengths, weaknesses, mass, density, or friction of various materials, like plastics and polymers, used in product design. This enables the manufacturer to make decisions about the best materials to build their product with before production begins; sort of a virtual materials-testing lab.

A VIEW TO A KILL

3D Studio is becoming the tool of choice among experts in the burgeoning field of forensic animation. It has the ability through the analysis of real world data to present a re-creation of physical events. The resulting flics are then output to video for courtroom viewing. Alex Jason (The Anite Group) pioneered the use of 3D Studio in a courtroom setting with the animation for the infamous Mitchell brothers murder trial. Jason is a ballistics specialist who has been involved with many shooting cases worldwide.

With no precedent to guide him, Jason has found some visually creative ways to present crime data. He animated the acoustics of a bullet's sound waves using the morphing function of 3D Studio. Another of his animations takes you on a point-of-view (POV) ride along the bullet's path of travel. He uses 3D Studio in combination with Autodesk Animator Pro to pull in actual crime scene and autopsy photos to show how all the evidence lines up. For example, in one case there was testimony that the victim was shot in the back, however, evidence proved that this was not possible. He emphasizes for the layperson that "the computer does not *solve* anything in these applications; it is a tool for visualization using the facts about the crime. The final piece is dependent upon the skill of the criminologist."

According to Jason, "Using 3D Studio is a bit like the combination of a puzzle and a video game. You have the sophistication and power of the program itself that you use in different ways with each case to solve problems, combined with the reward

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- Mouse & Mouse Pad

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- 16 bit **Sound Card**
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- Mouse & Mouse Pad

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- 2 Serial/1 Parallel/1 Game Port
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- PCI, S3, Local Bus Hi-Color SuperVGA Graphics Accelerator w/1MB
- 15" SuperVGA Color Monitor w/Tilt & Swivel Base (1280x1024 .28mm dp)
- Enhanced 101 Key Keyboard
- Mouse & Mouse Pad

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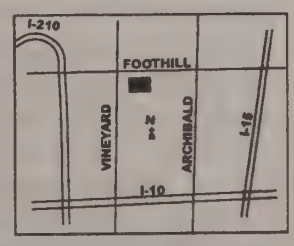

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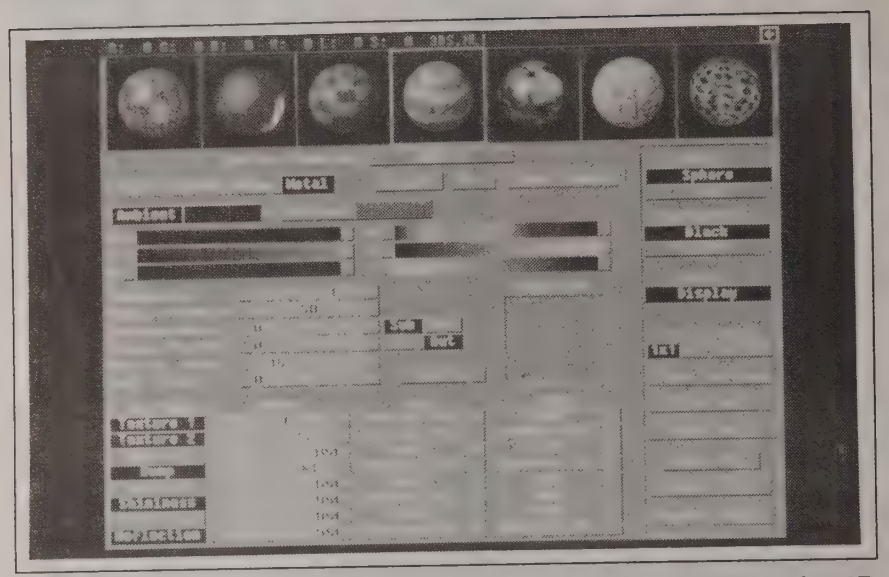

and excitement of how it will turn out." In the courtroom, "what makes 3D Studio so effective is that it shows the case visually. When you have to explain it just verbally it can be very difficult to follow: The victim walked ten feet south, the bullet traveled 30 degrees at a speed of so many miles per hour etc." He adds, "If one picture is worth a thousand words, then one crime animation is worth a thousand paragraphs of dry transcript details."

In a Salt Lake City trial the animation of a multiple murder was allowed into evidence. Based on expert testimony and the physical evidence, the dimensions and layout of the house where the crimes occurred were reconstructed in Autocad by Dan Forbes (The Software Machine) and then brought into 3D Studio for animation. The jury watched the murder unfold from the murderer's eyes—they watched his hands commit the murders as he walked through the house. The camera then panned to show the blood splatters all around him, which was not meant to sensationalize, but served as evidence to the manner in which the crimes were committed.

Forensic animation is an effective presentation in courtroom drama that is being used more often and is gaining acceptance among the legal community. It may someday be commonplace in the courtroom. Or, perhaps, instead of just watching the animation on video, the jurors might actually don a VR helmet and see for themselves, in a sort of "virtual court" what really happened.

ENTERTAINMENT AND VIDEO

Sony Imageworks uses 3D Studio for previsualizing movie scenes. This allows them to see how scenes will actually turn out before expensive film shoots take place. They create "digital" sets and props with AutoCAD and import them into 3D Studio. Release 3 features a projector camera that can play back any image as if through a projector's lens. Says Imageworks Vice President Frank Foster, "The sophistication of the cameras, the ability to simulate actual lenses on studio cameras, and the way we can move them and immediately see the changes is critically important when simulating feature film scenes." The ability to use 3D Studio brings the world of special effects down from the expensive, high-end platforms in "F/X" houses.

Richard Sher of CE3 Space Design, who uses 3D Studio for educational CD-ROM production and TV computer animation, says "3D Studio saves me expensive post-production house rental time with its ability to do compositing, mattes, and through the use of alpha channel. It's really helpful that glows, highlights, and transitions can be added using IPAS routines in 3D Studio's video post." Because TV pictures are overscanned, when going from the computer screen to TV playback the size of the image area is different, and, therefore the edges of your image may not fit on the screen. Release 3 has a "video safe" window that provides a guide to this boundary. Carlos Newcomb of Visions of Reality, a company that develops games and entertainment software, says "3D Studio was designed with video production in mind and this is where it shines, especially with the new gamma control in Release 3."

SPECIAL EFFECTS

If you want to create things like tornadoes, smoke, or flock behavior in birds, IPAS routines are external programs written in C that can be called from within 3D Studio to simulate real-world physics. They can also be used for other special effects like making an image completely in the brush stroke style of Van Gogh. 3D Studio comes with fourteen sample IPAS routines and third-party developers such as the Yost Group's IPAS Boutique (Schreiber Institute) or Pyros Partnership sell many other types.

MESHES AND MOTION LIBRARIES

Meshes are the building blocks of any animation, and while you can create your own 3-D meshes manually, they can often be time-consuming and technically difficult. A variety of meshes are also available through third-party vendors for import into 3D Studio. For example, human models are often used in forensic animation and in ergonomic studies for things like testing repetitive motion and angles of movement. They can be created in a program called Mannequin by HumanCAD. Viewpoint Datalabs offers a collection of meshes on CD-ROM that range from stegosauruses to cars, which you can browse through. They will then give you a code to unlock those images you wish to purchase. The skeletons viewed through X-Ray vision that look so realistic in the movie Toys were created from Viewpoint's fully articulated skeleton mesh and animated and rendered by Pacific Data Images.

> If one picture is worth a thousand words, then one crime animation is worth a thousand paragraphs of dry transcript details."
>
> —Jason Alex, The Anite Group

If you want to animate your mesh model and make it dance or walk or swim, you can of course, use keyframing or other traditional animation methods, or you can use motion libraries, which are in essence "canned motion" that you link to your model to make it move in predetermined ways. Thomas and Helene Knight of Imagination Works sell these sophisticated motion libraries as well as fully lifelike, articulated human models and clothing maps.

We are amidst a technological renaissance—not long ago many of these applications were unheard of, and not even remotely available for the PC. 3D Studio Release 3 presents thoughtful, practical improvements from the workstation-quality, 64-bit, true color rendering and ray traced shadows, to the improved materials editor and network rendering capabilities. Its extensibility gives it the scope and power to grow into many potential markets and bring to life many animators' visions. Given its long list of attributes it's no wonder that it is the industry leader in animation software for the PC. ■

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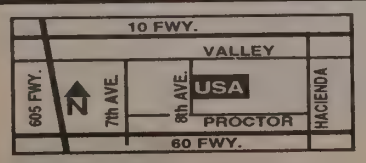

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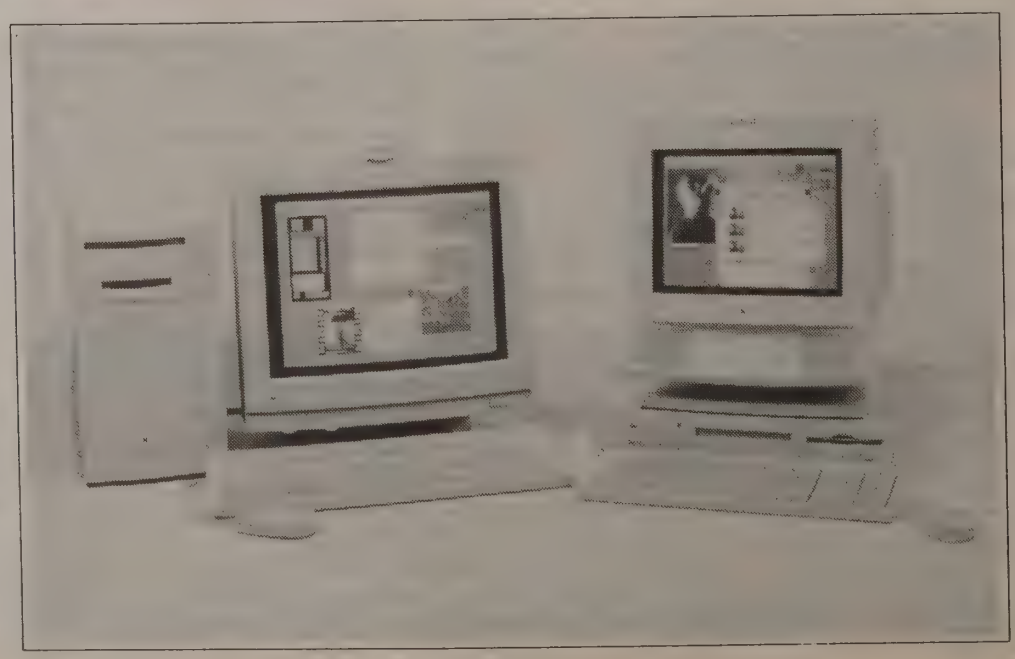
Multi & Media beyond

Mac Quadra AV

Awesomely Versatile

BY TONY REVEAUX

Step by step, multimedia capabilities are steadily moving into mainstream computing. The Macintosh started it by having sound included with every single unit—or "native" to the architecture—and supported by consistently modeled application tools for the developer. This meant that any software or peripheral they produced could include sound calls and work on all Macs.



Macintosh Centris ™ 660AV and Macintosh Quadra ™ 840AV. Courtesy of Apple Computer, Inc. Photo by John Greenleigh.

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MultiMedia & beyond

Macintosh Centris ™ 660AV shown with an Apple® AudioVision 14 Display, Apple Adjustable Keyboard and mouse. Courtesy of Apple Computer, Inc. Photo by John Greenleigh.

To this day, it's still a different story on the DOS and Windows side, where every sound board seems to have a unique driver configuration that needs to be negotiated and plea bargained into the existing setup of your computer.

Now, with the success of QuickTime, motion is joining sound to become an expected mode for productivity, education, and entertainment. Motion is much more complex than sound to support, but Apple's AVs jump out of the box with video native to their systems.

MULTIMEDIA POWER BASE

The Quadra 840 AV ($4069–$6249) is a tower configuration with a 40MHz 68040 CPU sparked by a 66MHz AT&T 3210 DSP (Digital Signal Processor), while the Quadra 660 AV ($2489–$3449) is based on the "pizza box" enclosure of the Centris 610, and runs on a 25MHz CPU with a 55MHz DSP.

A DMA (Direct Memory Access) chip hastens the communication between RAM and SCSI, Ethernet, floppy and serial ports, and serial I/O ports. The new SCSI Manager runs the disk operations asynchronously to unburden the CPU. The NuBus 90 speeds data transfer rates up to four times faster. The CPUs also have NTSC and PAL, composite and S-video inputs and outputs, the modem/GeoPort port, and ADB ports.

The DAV (digital audio/video) or "Dave" slot on the motherboard of the 840—and with an adapter to the 660—accepts expansion cards that enjoy direct access to digital video and audio for processing. (Some applications and other software products still encounter incompatibility problems—some minor, some major—with the AVs; hardware products, such as compression boards, may need a ROM update, and others will not be adaptable at all. As with the IIfx before, and the PowerPC to follow, you should check ahead if you are integrating an AV into an existing system or plan to expand an AV with other components.)

This raw horsepower, focused through the DSP, enables the AVs to accomplish several feats usually possible only with add-on components and subsystems. Apple's PlainTalk speech recognition and synthesis is an advanced technology in itself—16-bit audio capture and playback affords CD-quality sound manipulation. The optional GeoPort Telecom Adapter supports telecom, virtual faxmodem, and (when available) videoconferencing. Real-time video-in can be displayed in a 640 x 480 window, and full-screen, full-motion video can be displayed out to an NTSC, PAL, or SECAM monitor.

MULTIMODE CAPABILITIES

The new Macintosh AV series is actually a multimode package in which video is only one component. The AVs are tomorrow's computers wrapped up in an all-talking, all-singing, all-dancing Mac package. The AVs, and especially the 840s, are the most powerful and versatile desktop machines around, short of the low-end workstations from Sun and SGI. Especially for multimedia and desktop publishing, they can often be more effective because of the greater variety and richness of Mac-based software that is available. The recent Macworld Expo revealed the overflowing treasure chest of image processing, special effects, and graphics packages that are morphing away to beat the band.

Apple chose to use the AVs not only to introduce an easy-to-use video-ready machine, but also as the platform to demonstrate other new and advanced, but consumer-accessible technologies. PlainTalk, based on the Casper voice-recognition technology (which actually works), enables you to verbally control the Mac, given enough memory. It can generate CD-quality stereo sound.

With the built-in GeoPort telecommunications architecture, the AV can serve as a digital answering machine, fax machine, and email station. I've seen demonstrations where it provided easy-to-use desktop videoconferencing over a network, with quite acceptable quality. When the world catches up to providing the phone lines that can support video, this Mac will be there. The reason the AV can do all of those things is because of the advanced processor architecture and the built-in DSP.

VIDEO ON BOARD

Video production professionals find that the AV is Not Ready for Prime Time—you can't do broadcast quality or high-end industrial level on a consistent basis. There is no on-board compression, nor is there genlock, or any component in or out. According to Erik Holsinger, author of *MacWEEK Guide to Desktop Video* (Ziff-Davis Press), "Output video quality and video capture rates were very low. For the most part, they're saying that it's 'industrial quality.' What that means is that it doesn't conform to the RS170A spec for video. What you have then is a machine that offers a lot of potential but doesn't give you a lot of power for your money right now."

You should expect to add third-party compression boards and other components to go pro. Out of the box, the AV is "video ready" rather than being able to provide full-service video. Many producers recognize that, and carry on from there. Charles

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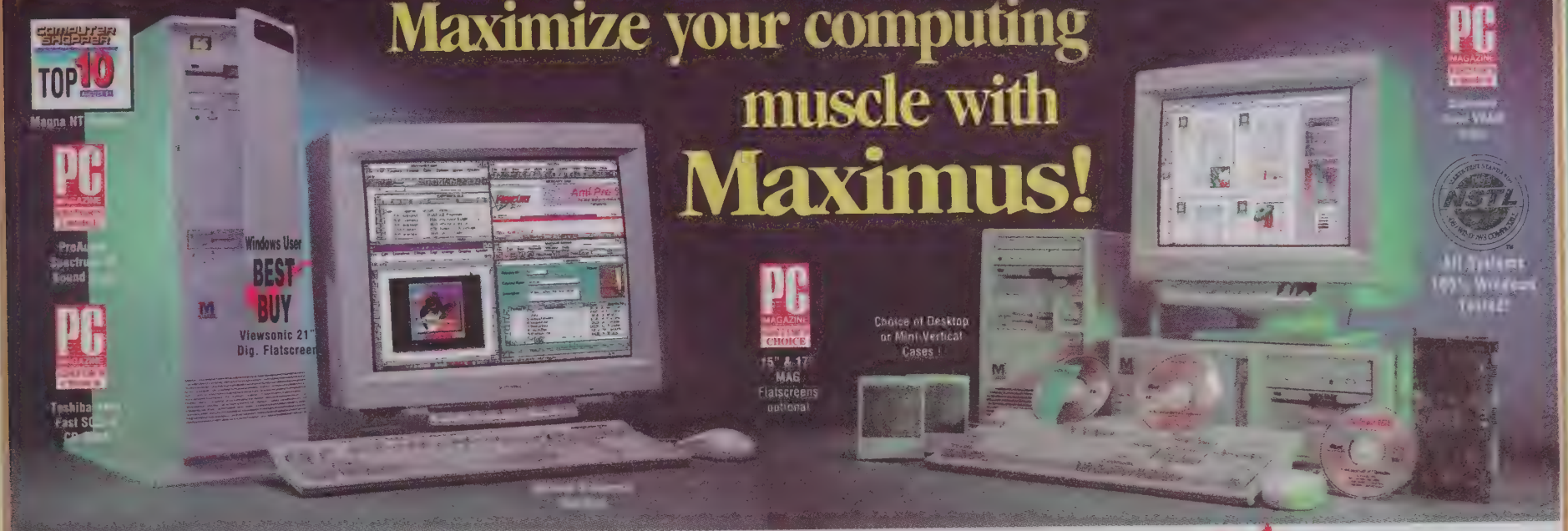

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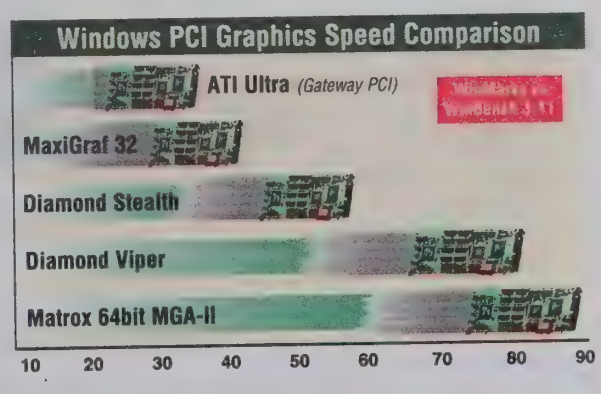

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continued from page 146

THE REVIVAL OF CD-ROM

I ask Florin about his postings on The WELL and his current position on CD-ROM technology. He replies, "It turns out actually that you can do more with it than we initially thought. I'm not necessarily in love with the primary technology, but it turns out that it's ubiquitous—or getting more ubiquitous—than any other multimedia technology and so, for now, it'll do just fine.

"I'm not saying that it's forever, that it's going to be the technology we're going to use, but it's been adopted as a standard by the majority of the market and so we've decided to go along with the rest of the folks. It's not the ideal technology but it's the best technology there is—the best platform there is.

"At that time, we were working a lot with full-motion video and with multimedia applications whose requirements were such that the CD was not the best device for delivering the experience. Since then we've learned what are good experiences the CD can deliver elegantly. We're not trying full-screen, full-motion video. Instead we're creating those games, combinations of still pictures, nice sounds, and limited animations. That's something that you can do well.

"Also, with the advent of faster CPUs and the advent of double-speed CD drives, a lot of these speed issues inherent in the technology have been resolved or at least are getting better. Back then we didn't have those fast CPUs and we didn't have the double-speed drives."

THE PRODUCTS

All this experience and user testing have paid off handsomely as far as making *Wacky Jacks* and *Travelrama USA* fun, entertaining, and easy-to-use products. Both are delightfully straightforward and deliver exactly what they are supposed to.

Wacky Jacks is a collection of four basic games in a game show format hosted by Wacky, a cartoon character amusingly voiced by the inimitable Mark Petrakis. Slap Happy involves matching pictures on the screen as they move around; Zingers is a tic-tac-toe game in which you answer questions related to the pictures and attempt to get four in a row; Blankety-Blank is a spelling game of filling in the blanks with clues provided by the pictures; Scrambler is a puzzle of correctly arranging the pieces of the picture.

Travelrama is an electronic "board" game where you travel around the USA collecting the necessary postcards. Both titles allow single players, although the real point is to play with others. *Wacky Jacks* has three levels of difficulty available to each player, while *Travelrama* has two. StarCore says that the games are suitable for ages 7 to 107, but *Wacky Jacks* should also be fun for children a couple of years younger.

Currently the games are available for color Macintoshes with a 68030 or faster processor at a retail price of $39.95. Both titles will be available for Windows machines in May. Call 1-800-708-STAR for details or check your local computer store. ■

MultiMedia & beyond

Wyke-Smith, a partner of Printz Electronic Design in San Francisco, says: "We find the Quadra 840 AV's horsepower combined with the compression capabilities of the Radius VideoVision board allow us to do full-screen at 60 fields-per-second with 640 x 480 resolution. Mostly we use the Quadra 840 AV when we're doing QuickTime. With the DSP chip, it just blazes—it's the fastest thing we can lay our hands on. Now we can do full-screen QuickTime, endlessly. We can just play it until our disk drive space runs out.

"The Quadra 840 AV is just faster than the Quadra 950. The 950 would take 'hits' on the digital video, where it would freeze and then move on. The 840 just scrapes under the barrier and allows us to do QuickTime fast. We use the NTSC video out on the 840 AV for laying scenes out on VHS for clients to see."

Terry Schussler of Gray Matter Design in San Francisco is a developer consultant who has worked on twenty CD-ROM titles in the last year. "Into a Quadra 840 AV I put in a Seagate Barracuda 2.1GB drive and added the full amount of 2MB of VRAM in order to have 24-bit color display capability, and a total of 24MB of RAM. I'm doing a lot of multimedia development work on Adobe Premiere and Macromedia Director.

"I've done video capture infrequently, mostly to do some rough videos, I'm doing work where I'm basically storyboarding on the video directions that I'm going to shoot later on, so I will input from a camcorder to QuickTime. I think it would be acceptable for in-house corporate department kinds of applications, but a lot of the video I work with is shot on Betacam SP, so I have to bring that into a serious environment. The whole computer environment itself only becomes a sort of comp area, and a delivery area for its final digitized form. I have explored solutions like the EyeQ DAV board, which is one of the best solutions you can use for video capture for CD-ROM." Thus far, the EyeQ is the only Dave board available. "The architecture is there—it just doesn't come with all the tools. If you canvass the community of multimedia developers, just about everybody will have a Quadra 840 AV, whether they bought it, borrowed it, or leased it."

VIDEOFUSION

What kind of video can you do with the AV? Apple has licensed SuperMac's VideoSpigot card technology for the AV's capture of video stills and motion sequences. Based on the Philips video capture chip, this 'Spigot provides similar frame rates to the $429 SuperMac card, and is optimized for QuickTime.

Without adding anything else, you can easily capture frames from any source and make QuickTime sequences. You can then output them to a TV monitor or print to videotape. Apple provides the software tools for this and for editing your QuickTime movies. You will find them on the installation CD-ROM or floppies that come with the machine. Apple's Video

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Charles Wyke-Smith, Printz Electronic Design:

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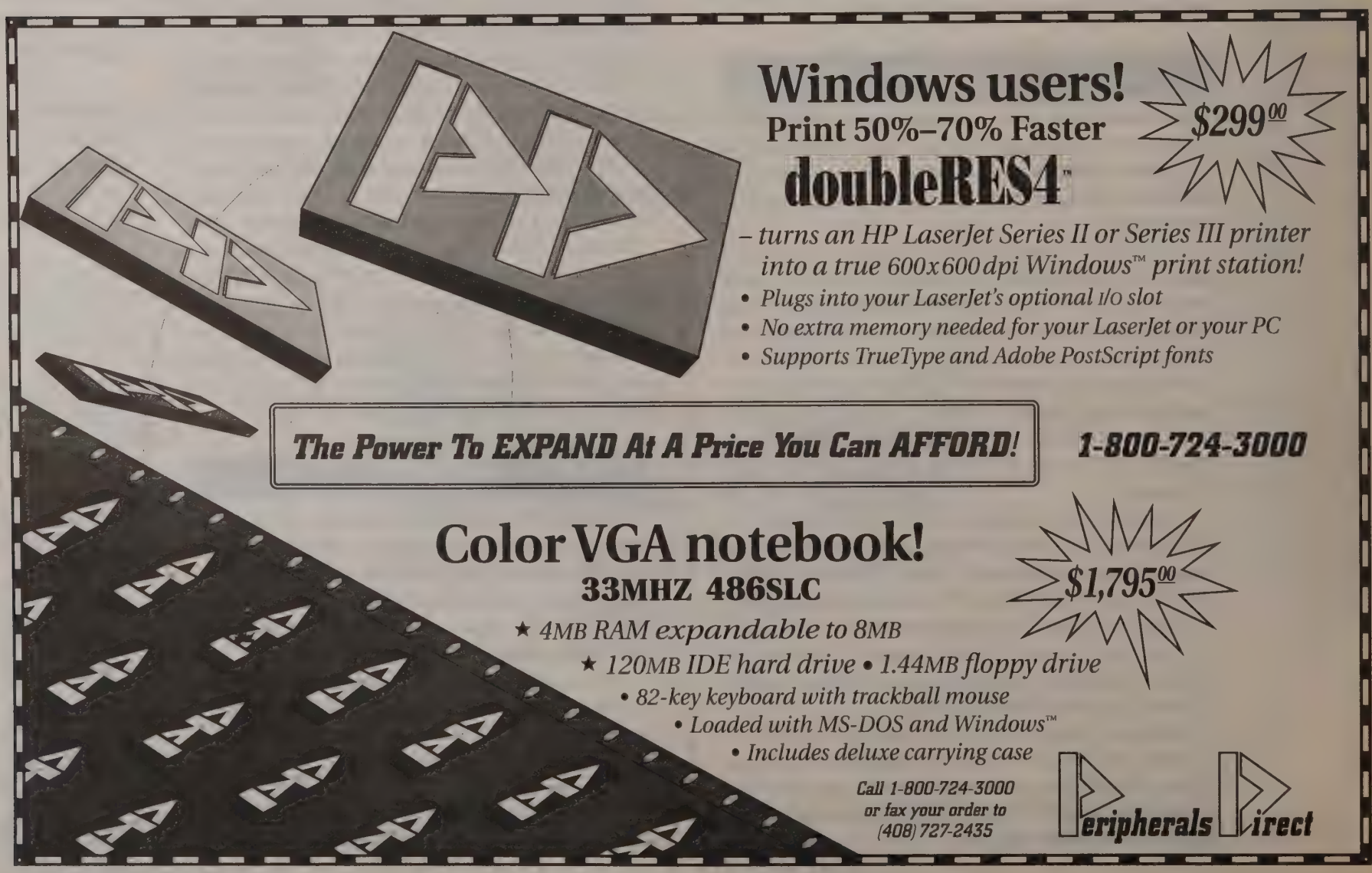
Monitor utility lets you view incoming video from a VCR or camcorder, and capture single frames.

I was able to use the full-screen option and find it of comfortably acceptable quality. Picture and sound were perfectly smooth and readable. From VideoFusion, there is Fusion Recorder, for recording QuickTime movies at different screen sizes and resolutions, and Quick FLIX, for easy cut-and-paste QuickTime editing. When you're ready for the next big step in advanced QuickTime artistry, you may go outside for Adobe Premiere, or the VideoFusion application which offers a powerful base for fine-editing and an extensive range of special effects and color balancing, including warping and morphing.

Once able to watch video on the same screen I use for everything else, it would seem awkward to have to go back to a separate TV to watch a computer-related tape. These days, many applications like Virtus VR, Playmation, and ElasticReality, come with VHS tapes that provide demonstrations and tutorials. Instructional tapes, like the series on Macromedia Director from Printz Electronic Design, should also be watched where you work. You will need enough RAM memory (16MB and above) to have applications like Director or Adobe Photoshop open at the same time as Video Monitor or Fusion Recorder, but when you do, all of it comes together, and it's as easy "As Seen on TV." ■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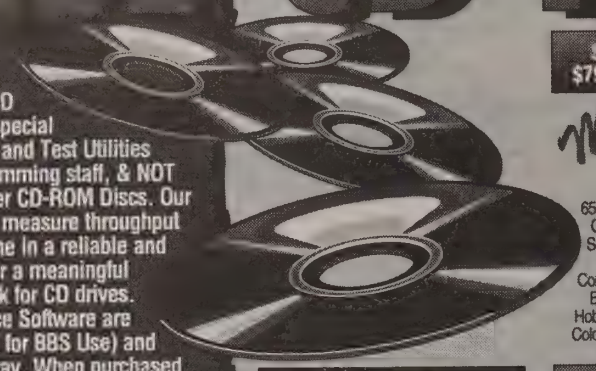

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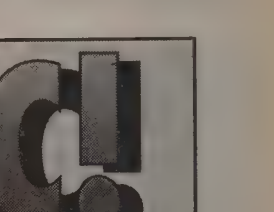

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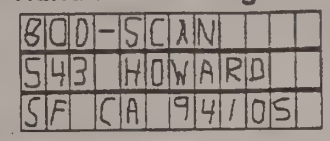

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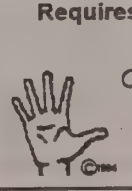

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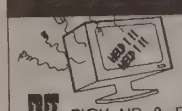

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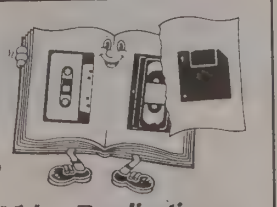

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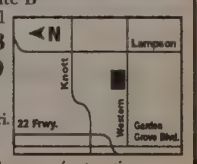

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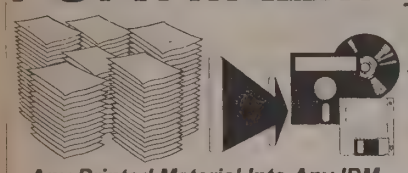

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MultiMedia & beyond

This is an excellent application for AmigaLink because a fast transfer rate is not a requirement.

continued from page 162

When I rebooted a node, I found that on remote nodes, I had to unmount and then remount any devices imported from the rebooted node. This was so, even though the Import program indicated the devices were mounted. You can click the "mounted" button twice or do it from the CLI. When there are a lot of devices, a script file to unmount devices works great.

I also found a conflict between my Goldengate 486 board and AmigaLink. However, as long as I didn't try to access a device on the Amiga with the GG486 while it was emulating, all was fine.

PERFORMANCE

Since Amiga floppy drives are no speed-burners, I was very interested to see what kind of performance a floppy port network could achieve. The manual states that the data transfer rate is 450,000 bits-per-second, which translates to about 55 kilobytes-per-second (kbps). My best case was a disappointing 40kbps on my network, while ParNet achieved around 61kbps.

However, this is only half of the story. During transfers, ParNet hogged CPU time, while AmigaLink barely required any. So although AmigaLink is slower than ParNet, it uses substantially less system resources, which could be a factor when multitasking. Still, AmigaLink is just fast enough not to cause an anxiety attack.

VIDEOTOASTER FARM

Spectronics is also considering releasing software to do simultaneous Lightwave rendering on multiple Amiga/Toaster systems. This is an excellent application for AmigaLink because a fast transfer rate is not a requirement. "Rendering farms"—just like the big boys (i.e., Amblin Imaging [*seaQuest DSV*] and Foundation Imaging [*Babylon 5*])—are now within the reach of smaller 3-D studios.

WORTH THE PRICE

This is an extremely important product for the Amiga. At $299 for a two-node network, AmigaLink may seem a little expensive, but a functionally equivalent Ethernet-based network would cost you many times that. AmigaLink performs like a full-fledged network—albeit a little slower—and is well worth its cost. ■

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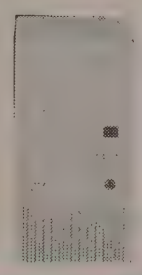

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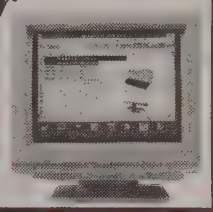

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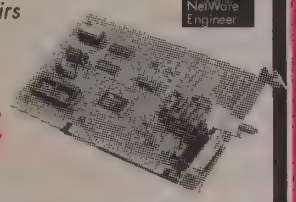

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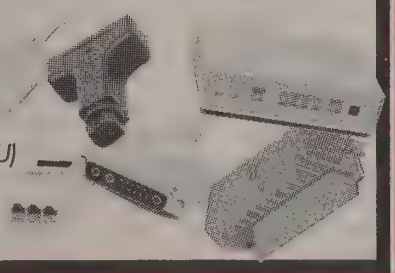

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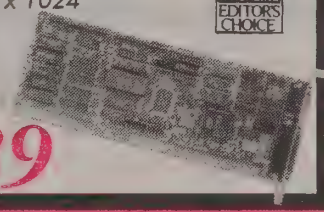

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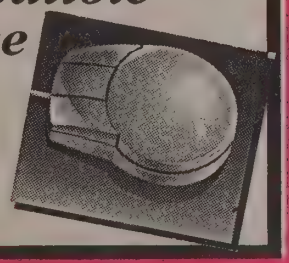

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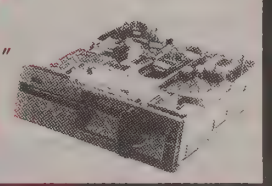

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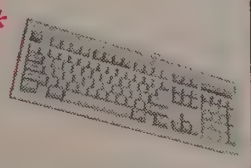

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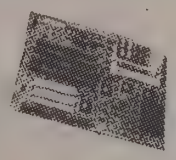

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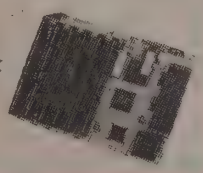

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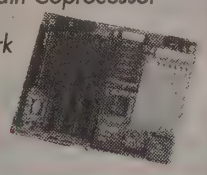

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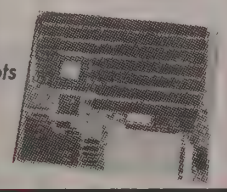

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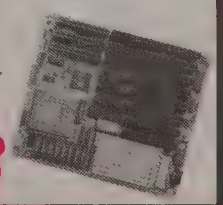

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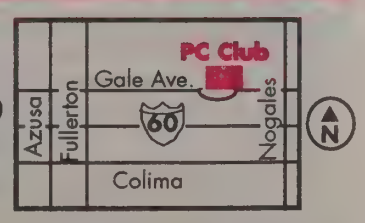

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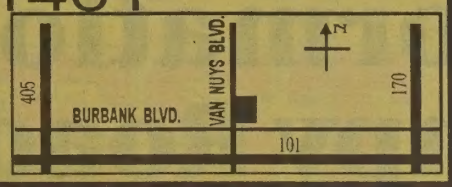

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* VESA standard, NON-INTERLACED display
* 2 serial, parallel, & game ports
* Enhanced 101 key keyboard
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* CPU cooling fan for extra protection
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* Enhanced 101 key keyboard
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* Enhanced 101 key keyboard
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* Enhanced 101 key keyboard
* Mini tower case w/ 230 Watt p.s.
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The Information Highway Is A Bumpy Road

or
Isn't Flaming Fun??

BY JOHN C. DVORAK

I went online the other day and downloaded a typical online forum discussion. Folks, this is what the Information Superhighway is really all about!

#: 0003859 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Barry Manilow 96543,99
To: Gene Buffoon 98881,19
You're so full of crap that your eyes are turning brown. Carol has done a fine job researching her book. I've seen pages I tell you. They're good and they nail Microsoft to the wall. You have a habit of making up facts as you go along! Where do you get these facts? From Microsoft! You're a stooge for the company.
Barry
There is 1 Reply.
#: 0003860 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Gene Buffoon 98881,19
To: Barry Manilow 96543,99
Up yours butthead. I'm no stooge, either. I'm a retired mechanical engineer and my real name is Gene Buffoon as silly as it may sound to you. In fact it's a grand English name in the highest tradition. My father was Marmaduke Buffoon, Earl of Campbell. But that's beside the point. In fact Carol is a stooge for IBM. Check her record and you'll see she worked there and before that with Digital Research. The book is full of lies.
There are 2 Replies.
#: 0003861 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Allen Simpson 97453,221
To: Gene Buffoon 98881,19
This forum is no place for personal attacks. You're a first grade jerk for calling Barry a butthead. And what are your credentials for even knowing the first thing about Carol and her book or who she worked for? Are you a private detective?
There is 1 Reply
#0003862 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Angelica Forsyth 98881,19
To: Allen Simpson 97453,221
I think you are being too harsh on Gene. He is a very bright and talented man who knows and understands many things. He is handsome, articulate and thoughtful. He would never say anything that wasn't 100% right on the money.
Angelica
#: 0003863 S1/General Information 26-Feb-94
Sb: #Microsoft Hatred
Fm: Edgar Cayce 94530,312
To: Gene Buffoon 98881,19
You are adding way too much negative energy into the collective superorganic orgone fields of pink and blue light. Back off! Creep!
#: 0003860 S1/General Information 26-Feb-94
Sb: #Fakes on-line
Fm: Barry Manilow 96543,99
To: All
Did anyone notice that Angelica has the same ID number as Buffoon!!
#: 0003865 S2/Useful Tips 27-Feb-94
Sb: #Which OS is For You?
Fm: Gene Buffoon 98881,19
To: Homer Simpson 99943,4331
I lost track of the thread. What do you mean "Eat my shorts?" What's the point of THAT comment?
#: 0003866 S2/Useful Tips 27-Feb-94
Sb: #Which OS is For You?
Fm: Marilyn McKesson 94530,312
To: Gene Buffoon 98881,19
This is supposed to be a forum of useful tips. Why are we running up the messages count with dumb commentary and stupidities such as your last message? When did the forum degenerate into this name-calling nonsense?
#: 0003867 S2/Useful Tips 27-Feb-94
Sb: #Which OS is For You?
Fm: Michael Mossman (IBM-Ind) 90006,2121
To: Charlotte Charles 90101,287
Sorry it took me so long to get back to you. There are patches on the IBM forum that solve your problems. Download patch9x.zip and take the device driver called dd89-8_a.dev and add it to the 37th line of the CONFIG.SYS file that was first provided with your system. Then rename the old CONFIG.SYS to CONFIG.OLD and run the program CHANGE.EXE giving the parameters /c/e/44(a) at the end of the execution string. Make sure both the CONFIG.SYS and CONFIG.OLD are in the same directory. CHANGE.EXE will make a new CONFIG from the two old CONFIG files and change the old CONFIG.OLD to CONFIG.BAK and make the old CONFIG.SYS to CONFIG.BA0. After you reboot this should finally make the Scroll Lock light turn off. If it is still lit then it's something Microsoft is doing with Windows that's the problem.
:) Mossman :)
#: 0003868 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: Charlotte Charles 90101,287
To: Michael Mossman (IBM) 90006,2121
I tried using CHANGE.EXE and got an error message.
#: 0003869 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: Dudley Pimental (team USA) 90000,3546
To: Charlotte Charles 90101,287
Did you run the latest version of CHANGE.EXE? I think you may have downloaded an old version of Patch9x.zip. Make sure the one you get is dated Jan 15 or newer.
#: 0003870 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: Charlotte Charles 90101,287
To: Dudley Pimental (team USA) 90000,3546
Thanks
#: 0003871 S2/Useful Tips 28-Feb-94
Sb: #Which OS is For You?
Fm: John C. Dvorak 96969,206
To: All
Having spent an hour reading the last couple of days' threads I want to thank you all for the enlightenment. As usual on the Information Highway I learned nothing. Have a nice day. ■

DVORAK'S LAST COLUMN

Copyright © 1994 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

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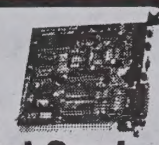

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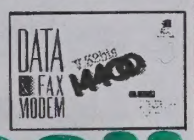

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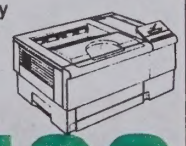

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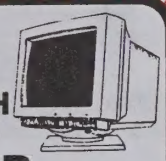

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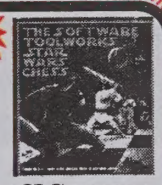

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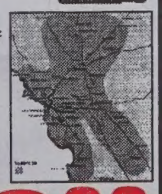

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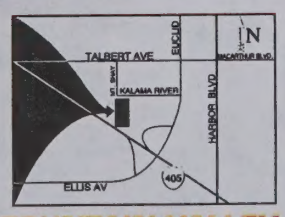

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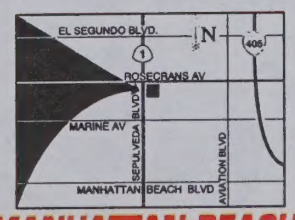

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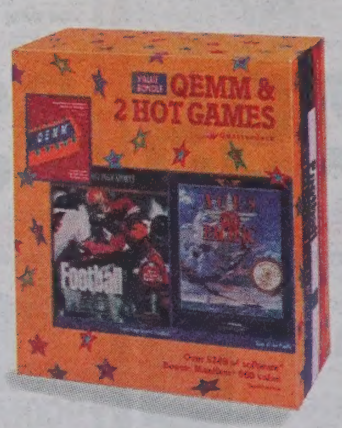

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